USER GUIDE

UGD034-0311

Carousel Plus Dryer

W Series Models 600 through 5000 with DC-2 Controls

Please record your equipment's model and serial number(s) and the date you received it in the spaces provided.

It's a good idea to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Please keep this User Guide and all manuals, engineering prints and parts lists together for documentation of your equipment.

Date: _____

Manual Number: UGD034-0311 _____

Serial Number(s): _____

Model Number(s): _____

See Screens 31 and 32 for Software Version

*Display Firmware Version: _____

*Display Menu Version: _____

*Control Firmware Version: _____

✎ * **NOTE:** Displayed upon initialization, during power up, or on a data tag inside the door.

Table of Contents

4-1 Operation

5-1 Maintenance

6-1 Troubleshooting

A Appendix

B Appendix

C Appendix

Addendum

Introduction

Purpose of the User Guide

This User Guide describes the Conair Carousel Plus W Series Dryer and explains step-by-step how to install, operate, maintain, and repair this equipment.

Before installing this product, please take a few moments to read the User Guide and review the diagrams and safety information in the instruction packet. You also should review manuals covering associated equipment in your system. This review won't take long, and it could save you valuable installation and operating time later.

How the Guide is Organized

Symbols have been used to help organize the User Guide and call your attention to important information regarding safe installation and operation.

⚠ Symbols within triangles warn of conditions that could be hazardous to users or could damage equipment. Read and take precautions before proceeding.

1 Numbers indicate tasks or steps to be performed by the user.

◆ A diamond indicates the equipment's response to an action performed by the user.

❒ An open box marks items in a checklist.

● A circle marks items in a list.

➙ Indicates a tip. A tip is used to provide you with a suggestion that will help you with the maintenance and the operation of this equipment.

✎ Indicates a note. A note is used to provide additional information about the steps you are following throughout the manual.

Using the Carousel Plus W Series as a Central Dryer

The Conair Carousel Plus W600 - 5000 Series Dryers are factory configured to be used as central dryers only. Therefore, this manual incorporates the information necessary to use these dryers for central drying applications.

Your Responsibility as a User

You must be familiar with all safety procedures concerning installation, operation and maintenance of this equipment. Responsible safety procedures include:

- Thorough review of this User Guide, paying particular attention to hazard warnings, appendices and related diagrams.

- Thorough review of the equipment itself, with careful attention to voltage sources, intended use and warning labels.

- Thorough review of instruction manuals for associated equipment.

- Step-by-step adherence to instructions outlined in this User Guide.

ATTENTION:
Read this so no one gets hurt

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

⚠ **WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.**

This equipment should be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

⚠ **WARNING: Voltage hazard**

This equipment is powered by three-phase alternating current, as specified on the machine serial tag and data plate.

A properly sized conductive ground wire from the incoming power supply must be connected to the chassis ground terminal inside the electrical enclosure. Improper grounding can result in severe personal injury and erratic machine operation.

Always disconnect and lock out the incoming main power source before opening the electrical enclosure or performing non-standard operating procedures, such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

ATTENTION:
Read this so no one gets hurt (continued)

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

CAUTION: Hot Surfaces.

Always protect yourself from hot surfaces inside the dryer and hopper. Also exercise caution around exterior surfaces that may become hot during use. These include the hopper door frame, the exterior of an uninsulated hopper, the return air hose and the dryer's process filter housing and moisture exhaust outlet.

WARNING: Do not place aerosol, compressed gas or flammable materials on or near this equipment.

The hot temperatures associated with the drying process may cause aerosols or other flammable materials placed on the dryer or hopper to explode.

How to Use the Lockout Device

⚠ **CAUTION:** Before performing maintenance or repairs on this product, you should disconnect and lockout electrical power sources to prevent injury from unexpected energization or start-up. A lockable device has been provided to isolate this product from potentially hazardous electricity.

Lockout is the preferred method of isolating machines or equipment from energy sources. Your Conair product is equipped with the lockout device pictured below. To use the lockout device:
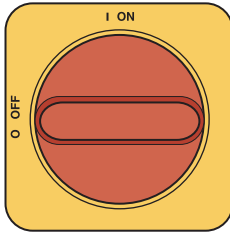
1 **Stop or turn off the equipment.**

2 **Isolate the equipment from the electric power.** Turn the rotary disconnect switch to the OFF, or "O" position.

3 **Secure the device with an assigned lock or tag.** Insert a lock or tag in the holes to prevent movement.

4 **The equipment is now locked out.**
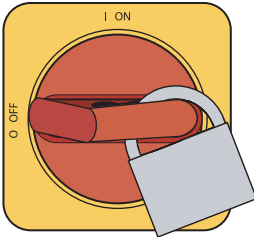
⚠ **WARNING:** Before removing lockout devices and returning switches to the ON position, make sure that all personnel are clear of the machine, tools have been removed, and all safety guards reinstalled.

To restore power to the dryer, turn the rotary disconnect back to the ON position:

1 **Remove the lock or tag.**

2 **Turn the rotary disconnect switch to the ON or "I" position.**
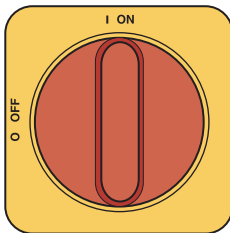
Description

What is the Carousel Plus W Series Dryer?

The Carousel Plus W Series Dehumidifying Dryer produces low-dewpoint air that removes moisture from hygroscopic plastics. The dryer pulls moist air from a drying hopper and circulates it through a dehumidifying desiccant wheel. The dryer then circulates the air through the material in the hopper.

The dryer's closed-loop design ensures a continuous supply of dehumidified air while preventing contamination from moisture in the plant.

Typical Applications

1 Dryer on the floor, single hopper (with HTC Hopper Temperature Control package) on a floor stand.

✎ **NOTE:** The W600 - 5000 provides no heat to the process air. A separate heat source is required at the hopper(s) inlet to heat the air to the desired drying temperature.

2 Dryer on the floor, multiple hoppers in central configuration (ResinWorks) with separate heat source for each hopper.

The Carousel Plus W Series Dryer can be used successfully in applications that require:

- A contamination-free drying environment.

- A constant flow of dehumidified air.

Typical Applications (continued)

Model	Drying Temperature Range
Low temperature (with precooler)*	100° - 150°F {38° - 66°C}
Standard	150° - 240°F {66° - 116°C}
High heat (with aftercooler/intercooler)*	150° - 375°F {66° - 191°C}
Low-high (aftercooler/intercooler & precooler)*	100° - 375°F {38° - 191°C}

* See page 3-17, 3-18 and Appendix B

- Throughput rates of 600 to 5000 lbs {271 to 454 kg} per hour (some materials can be ran at a higher rate).
- Dewpoints of -40°F {-40°C}.

Use the aftercooler/intercooler when:
- You are drying at temperatures over 240°F {116°C}.
- Throughput rates are less than 50% of the dryer's rated capacity.
- You are pre-drying material at temperatures over 150°F {66°C}
- The return air is 120°F {49°C} or above.

✎ **NOTE:** The aftercooler/intercooler reduces the temperature of air returning from the drying hopper, improving the efficiency of the desiccant.

Dryer Features
- Dewpoint monitor/dewpoint control
- Audible and visual alarm
- DeviceNet communications (Alternate communications are available)

✎ **NOTE:** Temperature setback is only available in conjunction with the Hopper Temperature Controller (HTC) or ResinWorks system.

✎ **NOTE:** Carousel Plus W Series 600-1000 Dryers use an aftercooler located before the the process blower. Carousel Plus W Series 1600-5000 uses an intercooler located after the process blower.

How It Works

■ The Process (Drying) Cycle (W600 - 1000)

Process air from the hopper is pulled into the dryer, through the process filter and then into the process blower inlet. Air exits the process blower and then enters the aftercooler, then passes through the desiccant wheel, where moisture is removed. The air exits the dryer and passes through the precooler (if installed), then into the process heat source (HTC or CGT Gas Unit). After the air exits the process heat source it then goes into the hopper inlet, then to the spreader cone, which evenly distributes the air through the material.

■ The Process (Drying) Cycle (W1600 - 5000)

Process air from the hopper is pulled into the dryer, through the process filter and then into the process blower inlet. Air exits the process blower and then enters the intercooler, then passes through the desiccant wheel, where moisture is removed. The air exits the dryer and passes through the precooler (if installed), then into the process heat source (HTC or CGT Gas Unit). After the air exits the process heat source it then goes into the hopper inlet through internal piping, then to the spreader cone, which evenly distributes the air through the material.

■ The Regeneration Cycle

The regeneration blower pulls air through the regeneration filter into the dryer's regeneration heater. The air is heated to 350°F {177°C} before it is pushed into the "wet" section of the desiccant wheel. The hot air purges moisture from the desiccant. The moist air is blown out the moisture exhaust at the top of the dryer.

☐ The Cooling Cycle (All models except W2400 and W5000)

Regenerated desiccant must be cooled before it rotates back into the process cycle. The process blower pushes the process air through the desiccant wheel. A small amount of the process air is diverted through a small section of the desiccant wheel to cool the air. The cooling air then returns back to the process air stream at the start of the process cycle.

How It Works (continued)

(W600 - 1600 and 3200)

ALARM BELL

ALARM LIGHT

HTC/GASTRAC
PROCESS HEAT SOURCE

REGENERATION
BLOWER

REGENERATION
AIR FILTER

HIGH TEMP
SHUTOFF

REGENERATION
HEATER

REGENERATION
RTD

DESICCANT
WHEEL

HOPPER

REGENERATION
OUTLET
RTD

DEWPOINT MONITOR/
CONTROL

RETURN
AIR
RTD

RETURN
AIR
FILTER

RETURN
AIR
RTD

AFTERCOOLER

INTERCOOLER

PROCESS
BLOWER

PROCESS

COOLING

REGENERATION

CENTRAL DRYER OPTIONS
1 PROCESS CFM MONITOR   3 PROCESS FILTER STATUS
2 CURRENT METER

W-series 600-1000
aftercooler location.

W-series 1600-5000
intercooler location only.

✎ **NOTE:** Earlier W1600-5000 dryers will have their intercoolers in the W600-1000 location.

✎ **NOTE:** Carousel Plus W Series 600-1000 Dryers use an aftercooler located before the the process blower. Carousel Plus W Series 1600-5000 dryers use an intercooler located after the process blower.

How It Works (continued)

(W2400 and W5000)

ALARM BELL

ALARM LIGHT

HTC/GASTRAC
PROCESS HEAT SOURCE

REGENERATION
BLOWER

REGENERATION
AIR FILTER

HIGH TEMP
SHUTOFF

REGENERATION
HEATER

2

REGENERATION
RTD

HOPPER

DESICCANT
WHEEL

RETURN
AIR
RTD

REGENERATION
OUTLET
RTD

RETURN
AIR
FILTER

3

1

INTERCOOLER

PROCESS
BLOWER

PROCESS

COOLING

REGENERATION

CENTRAL DRYER OPTIONS
1 PROCESS CFM MONITOR   3 PROCESS FILTER STATUS
2 CURRENT METER

Power Purge

W 2400 and 5000 models have a Power Purge (cooling fan)
feature integral to the desiccant wheel assembly.

✎ **NOTE:** Carousel Plus W Series 600-1000 Dryers use an
aftercooler located before the the process blower. Carousel
Plus W Series 1600-5000 dryers use an intercooler located
after the process blower.

Reactivation Air

Wet Air

Hot Air

Cool Air

Dry Air

Process Air

Drive Motor

Protected under
United States Patent
No. 7,101,414 and
other US and Foreign
Patents Pending.

Patented HoneyCombe® wheel
design provides a vast surface
area for desiccant .
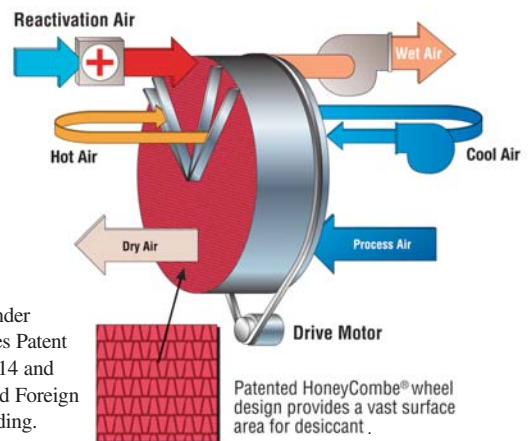
Specifications: Carousel Plus W Series Dehumidifying Dryers
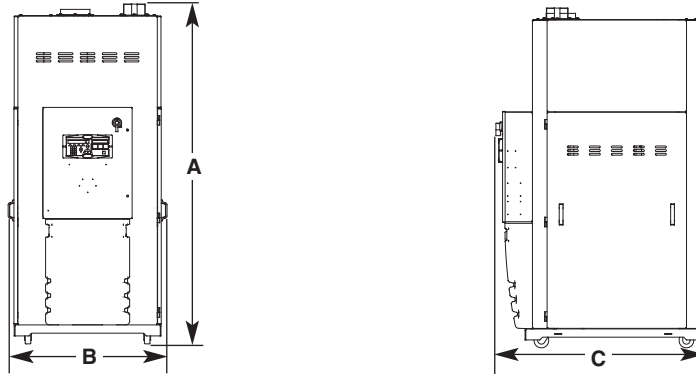
MODELS	W600*	W800*	W1000*	W1600*††	W2400*††	W3200*††	W5000*††
Performance characteristics (with full hopper)							
Drying temperature	All models 100 - 375°F {38 - 191°C} with options						
Dewpoint	All models -40°F {-40°C}						
Dimensions inches {cm}							
A - Height	92.6 {235.2}			95.5 {242.6}		102.8 {261.1}	
B - Width	43.3 {109.9}			48.3 {122.7}		48.9 {124.2}	
C - Depth	57.6 {146.3}			86.2 {218.9}		112.0 {284.5}	
Outlet/inlet hose diameter	8 {20.3}			12 {30.5}		12 {30.5}	
Approximate weight lbs {kg}							
Installed	1300 {590}	1300 {590}	1400 {636}	1600 {726}	1600 {726}	2000 {907}	2000 {907}
Shipping	1495 {678}	1515 {687}	1515 {687}	2100 {953}	2620 {1188}	3385 {1535}	3385 {1535}
Voltage - Total amps							
400 V/3 phase/50 Hz†	37.2	37.2	37.5	64.7	73.7	122.3	128.0
460 V/3 phase/60 Hz	32.0	32.0	32.2	56.3	63.1	106.6	111.0
575 V/3 phase/60 Hz	25.6	25.6	25.7	45.0	50.5	85.3	89.1
Water requirements {for aftercooler/intercooler or optional precooler}§							
Recommended temperature**	45° - 85°F {7- 29}						
Water flow gal./min. {liters/min.}	6-25 {22.7-94.6}		12-40 {45.4-151.4}			15-50 {56.8-189.3}	
Water connections NPT	1 1/2 in. NPT						

SPECIFICATION NOTES:

*   Dryers W600-W5000 are central dryers and do not have process heaters. Hopper Temperature Controllers (HTC's) or ResinWorks systems are used at the hopper for heating the process air. See the Hopper Temperature Controller (HTC) specification sheet for additional information.

†   Dryers running at 50 Hz will have 17% less airflow, and a 17% reduction in material throughput.

‡   Total kW listed at a regeneration temperature of 350°F {177°C}.

§   When drying below 150 °F {66°C} a precooler is required. When drying above 180°F {82°C} an aftercooler/intercooler and insulated drying hose is required.

**   Temperatures above or below the recommended levels may affect dryer performance. Tower, chiller or municipal water sources can be used.

††   Models W1600-5000 do not have casters.

   Specifications may change without notice. Consult a Conair representative for the most current information.

Carousel Plus W Series Dehumidifying Dryer Options

- **Volatile trap** (only in conjunction with aftercooler/intercooler) - The volatile trap is recommended if drying materials that produce volatile that condense into a waxy or oily residue and/or if the material contains excessive fines.

- **Precooler** - The precooler reduces the temperature of air after the desiccant wheel and before the process heater, which enables the dryer to control temperatures at low setpoints, (100º - 150ºF {38º - 66ºC})

- **Filter check** - The filter check sensor will activate a passive alarm when the process filter is clogged or needs to be replaced.

- **CFM monitor** - The CFM monitor measures the cubic feet per minute of air flow across the inlet/outlet of the process blower.

- **Communications** - Allows the dryer to be networked to industrial control systems. DeviceNet is standard. Modbus, SPI and Ethernet are available.

- **Heater current monitor** - The heater current monitor measures the total amperage across both the process and regeneration heaters and the pre-determined power consumption values for the blowers and the control.

✎ **NOTE:** Temperature setback is only available in conjunction with the Hopper Temperature Controller (HTC) or the ResinWorks system.

✎ **NOTE:** The Drying Monitor 2 (DM-II) is for use with single hopper applications, it is not applicable on ResinWorks systems.

Installation

Unpacking the Boxes

The Carousel Plus W Series Dryer comes in one to four boxes, depending on the model and options ordered. The boxes could include (depending on the options selected):

- Carousel Plus W Series Dryer

- Delivery air hose

- Return air hose

- User Guide

1 **Carefully remove the dryer and components** from their shipping containers. Note that the dryer is secured to its shipping container with metal bands that pass through the bottom of the dryer frame.

2 **Unbolt any additional items secured to the shipping pallet,** such as the regeneration exhaust cover and return air adapter. (Carousel Plus W Series 1600-2400 Dryers will have a dry air delivery adapter. Carousel Plus W Series 3200-5000 Dryers will have a dry air delivery adapter and an overhead process air duct.)

3 **Remove all packing material,** protective paper, tape, and plastic.

4 **Cut and remove the desiccant wheel tie** securing the wheel assembly. (W600-1000)

5 **Carefully inspect all components** to make sure no damage occurred during shipping, and that you have all the necessary hardware.

Unpacking the Boxes (continued)

6 **Take a moment to record serial numbers** and electrical power specifications in the blanks provided on the back of the User Guide's title page. The information will be helpful if you ever need service or parts.

7 **You are now ready to begin installation.**
Follow the preparation steps on the next page, then choose one of the two mounting options:
- Dryer on the floor, single hopper (with HTC Hopper Temperature Control package) on a floor stand.
- Dryer on the floor, multiple hoppers in central configuration (ResinWorks) with separate heat source for each hopper.

✎ **NOTE:** The W600 - 5000 provides no heat to the process air. A separate heat source is required at the hopper(s) inlet to heat the air to the desired drying temperature.

Preparing for Installation

The Carousel Plus W Series Dryer is easy to install if you plan the location and prepare the mounting area properly.

1 **Make sure the mounting area provides:**

❐ **A grounded power source supplying the voltage and correct current** for your dryer model. Check the dryer's serial tag (on the control box) for the correct amps, voltage, phase, and cycles. Field wiring should be completed by a qualified personnel to the planned location for the dryer. All electrical wiring should comply with your region's electrical codes.

❐ **A source of water, when using the aftercooler/intercooler and/or precooler.** The W Dryer's aftercooler/intercooler and/or precooler require tower, city, or chiller water at temperatures of 45° to 85°F {7° to 29°C}. Refer to the Specifications Sheet (page 2-7) for flow rate for your unit. Piping should be ran to the planned dryer location. Use flexible hose to connect the water pipes to the aftercooler/intercooler and/or optional precooler.

❐ **Minimum clearance for safe operation and maintenance.** You should maintain 24 in. {61 cm} clearance on all sides of the dryer.

➡◆ **TIP:** If you plan to use vacuum or compressed air loaders to fill the hopper, install conveying lines to the drying hopper location.

✎ **NOTE:** The aftercooler/intercooler reduces the temperature of air returning from the drying hopper, improving the efficiency of the desiccant.

Positioning the Dryer on the Floor

1 **Lift the dryer from the shipping container** using a fork truck.

2 **Position the dryer on the floor** near the hopper or ResinWorks sled. Make sure the location allows for the connection of all hoses, keeping hose lengths as short as possible.

Removing the Cable Tie from the Desiccant Wheel (W600-1000 models)

1 **Open the dryer side panels and remove the cable tie securing the desiccant wheel,** if it was not done while unpacking the dryer.

Desiccant Cable Tie

Installing the Regeneration Exhaust Cover

The Carousel Plus W Series Dryer's regeneration exhaust cover must be installed.

To install the regeneration exhaust cover:

1 **Remove the exhaust cover that is attached to the dryer's shipping pallet.**

2 **Locate the bolt pattern at the top of the dryer**, on top of the regeneration exhaust outlet.

3 **Position the regeneration exhaust cover on top of the regeneration exhaust outlet**, aligning both bolt patterns.

4 **Secure the regeneration exhaust cover with supplied hardware**, using an appropriately sized wrench.
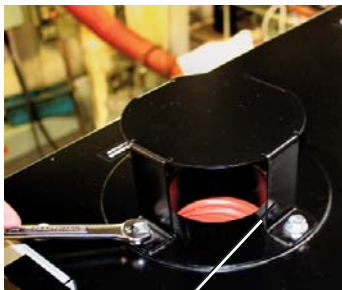
Regeneration
Exhaust Cover

Installing the Return Air Adapter

The Carousel Plus W Series Dryer's return air adapter must be installed.

To install the return air adapter:

1 **Remove the return air adapter that is attached to the dryer's shipping pallet.**

2 **Locate the bolt pattern on the top of the dryer**, on top of the return air inlet.

3 **Position the return air adapter on top of the return air inlet**, aligning both bolt patterns.

4 **Secure the return air adapter with supplied hardware**, using an appropriately sized wrench.
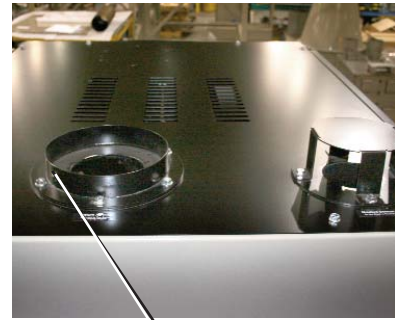
Return Air
Inlet Adapter

Installing the Return Air Inlet and Air Outlet Adapters (W1600 - 5000)

The Carousel Plus W Series Dryer's return air inlet and air outlet adapters will be removed when the dryer is shipped

To install the return air inlet and air outlet adapters:

1 **Remove the return air inlet and air outlet adapters that are attached to the dryer's shipping pallet.**

2 **Locate the bolt patterns on the top of the dryer**, on top of the return air inlet and air out outlet.

3 **Position the return air adapter on top of the return air inlet**, aligning both bolt patterns.

4 **Secure the return air adapter with supplied hardware**, using appropriately sized wrench.

5 **Position the air inlet adapter on top of the inlet air inlet**, aligning both bolt patterns.

6 **Secure the air inlet adapter with supplied hardware**, using an appropriately sized wrench.

Return Air Inlet Adapter

Dry Air Outlet Adapter

Installing the Overhead Process Air Duct (W3200 - 5000)

The Carousel Plus W Series Dryer's overhead process air duct will be removed when the dryer is shipped.

To install the overhead process air duct:

1 **Remove the overhead process air duct that is attached to the dryer's shipping pallet.** The piping will be shipped as one unit with included gaskets (2).

2 **Locate the bolt patterns on the top of the dryer**, over top of the overhead process air duct inlet and outlet.

3 **Position the overhead process air duct on top of the overhead process air duct inlet and outlet making sure to place supplied gaskets between the overhead process air duct and the inlet and outlet of the dryer**, align all bolt patterns.

4 **Secure the piping with supplied hardware**, using an appropriately sized wrench.

Overhead Process Air Duct

Gaskets (2)
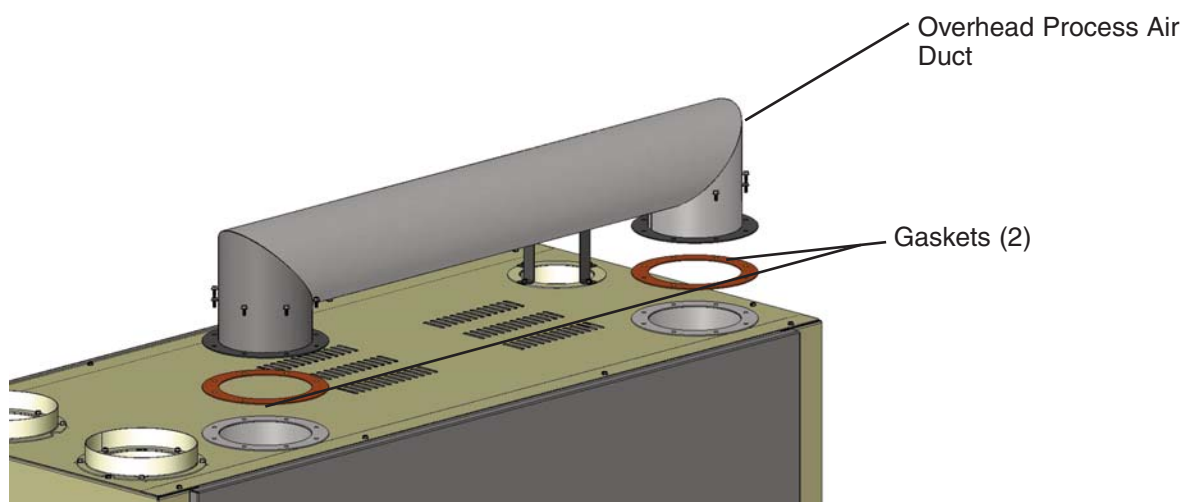
Connecting the Main Power

⚠️ **CAUTION:** Always disconnect and lock out the main power sources before making electrical connections. Electrical connections should be made only by qualified personnel.

1 **Open the dryer's electrical enclosure.** Turn the disconnect dial on the dryer door to the Off or "O" position. Lock out the main power (see Page 1-6 for complete lock out information). Turn the captive screw, and swing the door open.
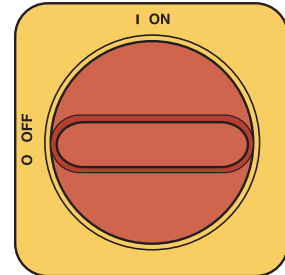
2 **Insert the main power wire** through the knockout in the side of the enclosure or the rear of the dryer. (the dryer's electrical wire connection location was a factory option and may be connected through the front or the rear of the dryer.) Secure the wire with an appropriate strain relief.

IMPORTANT: Always refer to the wiring diagrams that came with your dryer before making electrical connections.
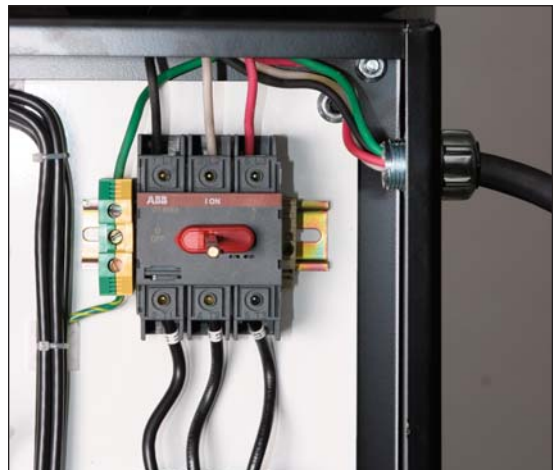
3 **Connect the power wires** to the three terminals at the top of the power disconnect holder.

4 **Connect the ground wire** to the ground lug as shown in the photo.

Opening the Dryer Doors
(W1600 - 5000)

Carousel Plus W Series 1600-5000 Dryers designed after August 2007 will have locking side panel door bolts.

To unlock the side panel door bolts:

1 **Rotate the two (2) locking door bolts on the dryer door counterclockwise** with a regular screw driver.

2 **Close the dryer doors and rotate the two (2) locking door bolts clockwise** to resecure the dryer doors.
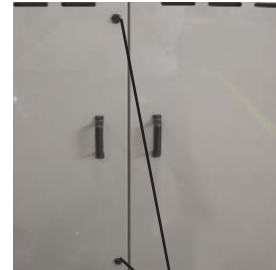
Dryer Door
Locking Bolts (2)
(W1600-5000)
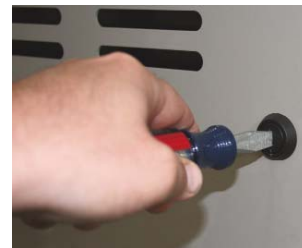
Checking for Proper Air Flow

This procedure is needed on W600-5000 models if the phase detection option was not ordered with the dryer.

IMPORTANT: This procedure must be performed before the dryer's air hoses are connected to the hopper or before loading material into the hopper.

⚠ **CAUTION:** If the air flow direction is incorrect due to improper phase connection, material from the hopper can be pulled back into the dryer, causing permanent damage to this equipment.

1 **Turn on the main power to the dryer.** Make sure the dryer's disconnect dial is in the ON position. This powers up the control and the display lights will illuminate.

2 Press the START button then the STOP button.

(continued)

Checking for Proper Air Flow (continued)

Dry Delivery
Air

✎ **NOTE:** Models W600-1000 dryer aftercooler and dry air delivery configuration shown. Location on larger models are different. Refer to the labeling on your dryer. See Installation section entitled, Installing the Return/Delivery Air Adapters, for proper air line connections.

3 **Visually verify the blower motor is moving in the correct direction indicated by the arrow on the blower housing.** The W series 600-5000 dryers are equipped with centrifugal process blowers.

Direction
Indication
Arrow

(continued)

Checking for Proper Air Flow (continued)

4 If air flow is incorrect disconnect power, follow proper lockout procedures and swap any 2 of the 3 main power wires.

⚠ **WARNING:** All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the the machine serial tag and data plate.

✋ If the air flow is reversed, the process blower is turning in the wrong direction. Turn off and lock out the main power source. Open the electrical enclosure and reverse any two leads connecting the main power supply to the dryer.
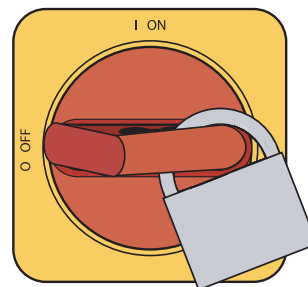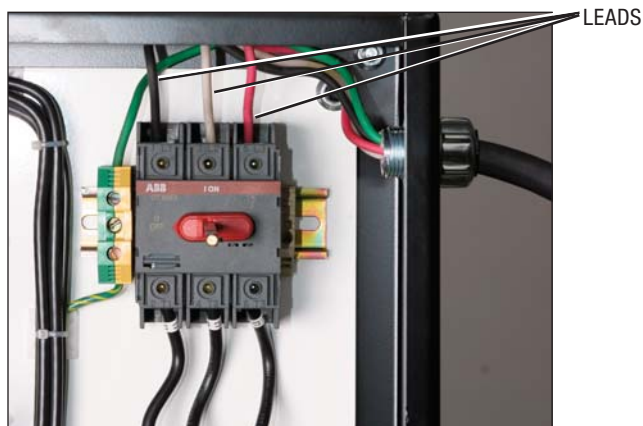
LEADS

⚠ **WARNING:** All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the the machine serial tag and data plate.

Connecting the Air Hoses to a Single Hopper (W600 - 1000)

Using the two flexible hoses provided, connect the inlet of the HTC and outlet of the drying hopper to the dryer. Make sure the dryer is located as close as possible to the hopper (approximately 10 ft {3.05 m}).

✎ **NOTE:** Models W600-1000 dryer aftercooler and dry air delivery configuration shown. Location on larger models are different. Refer to the labeling on your dryer.
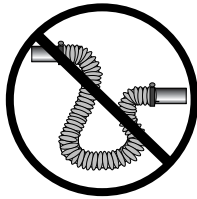
1 **Attach one hose from the return air inlet, located on top of the dryer,** to the outlet of the hopper.

Return Air
Inlet Adapter

✎ **NOTE:** Do not allow the flexible hoses to kink or crimp.
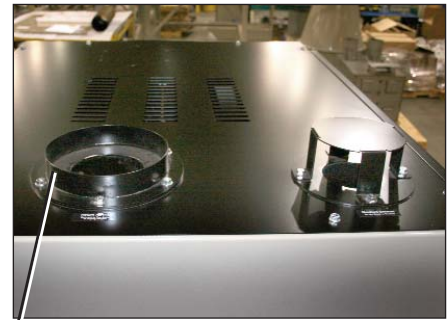
2 **Attach one hose from the delivery air outlet** to the inlet of the HTC.
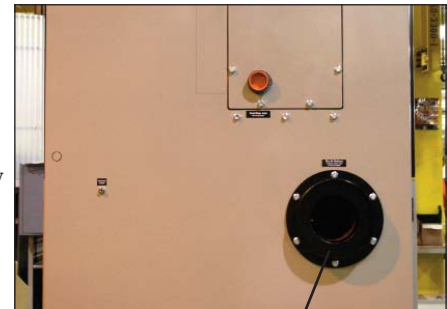
Dry Delivery Air
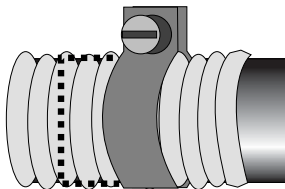
3 **Secure hoses with clamps.** The hose clamp should be secured at least 1/4 in. {0.64 cm} from the end of the inlet or outlet tube.

Connecting the Air Hoses to a Single Hopper (W1600 - 5000)

Using the two flexible hoses provided, connect the inlet of the HTC and outlet of the drying hopper to the dryer. Make sure the dryer is located as close as possible to the hopper (10 ft {3.05 m} of hose supplied).

1 **Attach one hose from the return air inlet, located on top of the dryer,** to the outlet of the hopper.

Return Air
Inlet

✎ **NOTE:** Do not allow the flexible hoses to kink or crimp.

2 **Attach one hose from the delivery air outlet, located on top of the dryer,** to the inlet of the HTC.

Delivery Air
Outlet

3 **Secure hoses with clamps.** The hose clamp should be secured at least 1/4 in. {0.64 cm} from the end of the inlet or outlet tube.
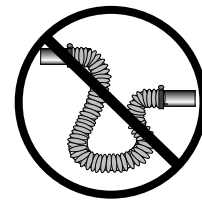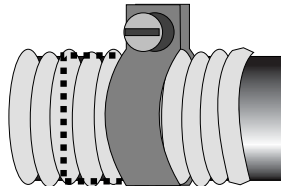
Connecting the Air Hoses to a ResinWorks

Using the two flexible hoses provided, connect the delivery air and return air manifolds of the ResinWorks to the dryer. Make sure the dryer is located as close as possible to the sleds (10 ft {3.05 m} of hose supplied).

1 **Attach one hose from the return air inlet** of the dryer to the return air manifold of the ResinWorks.

2 **Attach one hose from the delivery air outlet** of the dryer to the delivery air manifold of the ResinWorks.

3 **Secure hoses with clamps.** The hose clamp should be secured at least 1/4 in. {0.64 cm} from the end of the inlet or outlet tube.

Dry Delivery Air

Return Air
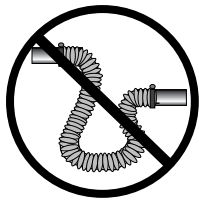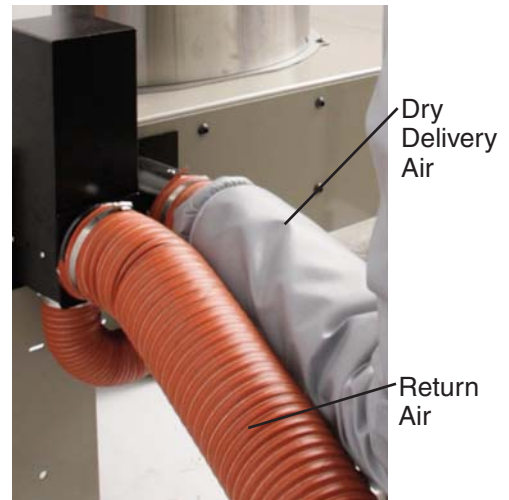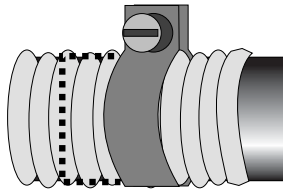
Insulated hose shown not standard.

✎ **NOTE:** Do not allow the flexible hoses to kink or crimp.

Dry Delivery Air

Return Air
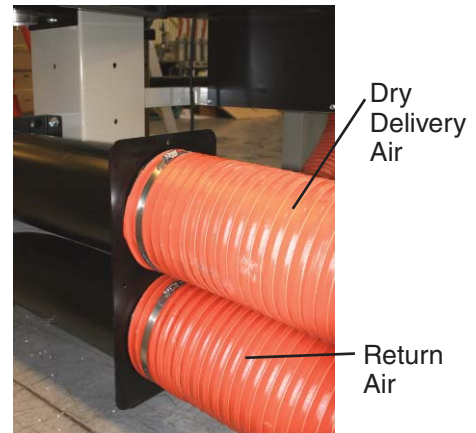
Connecting the Dryer to the Hopper

If your dryer hose connection and your hopper HTC hose connection are not the same size, you will need a hose adapter. Contact Conair Parts 1 800-458-1960.

Connecting the Dryer to

✎ **NOTE:** Because the W600 - 5000 models require a separate heat source for the delivery air, all references to this heat source will be identified as "HTC" (Hopper Temperature Controller). When using this dryer with an HTC, reference the User Guide supplied with the HTC for installation instructions.

ResinWorks

If your dryer hose connection and the connection on your ResinWorks sled are not the same size, you will need to use a hose adapter. Contact Conair Parts 1 800-458-1960.

✎ **NOTE:** Because the W600-5000 models require a separate heat source for the delivery air, all references to this heat source will be identified as ResinWorks. When using this dryer with a ResinWorks sled reference the User Guide supplied with the ResinWorks sled for installation instructions.

Connecting Air Hose Adapters

Depending on the hopper you purchased you may need to install an air hose adapter to connect the hopper to your dryer.

To connect the air hose adapter:

1 **Place a high temperature gasket approximately half way down from the end of the dry air delivery outlet.**

Dryer Inlet/Outlet Connection
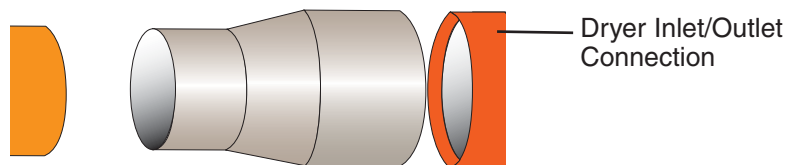
2 **Place hose adapter inside high temperature gasket flush to the dryer outlet, secure with pressure clamp.**

Pressure Clamp
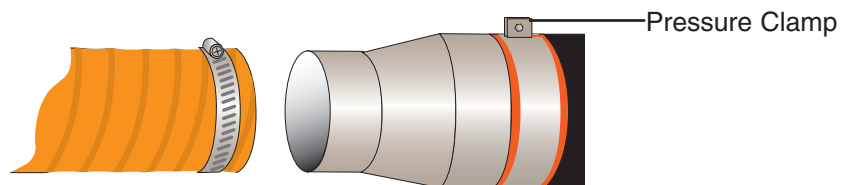
3 **Attach the hopper inlet hose over the adapter, secure with clamp.**
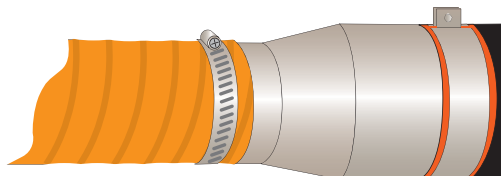
Connecting the Aftercooler and Optional Precooler (W600 - 1000)

The aftercooler and/or optional precooler require a source of city, tower, or chiller water and a discharge or return line. You can use water at temperatures of 45 to 85°F {7 to 29°C}. But the water flow should be at least 3 gal/min {11.4 liters/min}.

Aftercooler Inlet

1 **Connect the water supply line to the aftercooler or precooler inlet.** If a manual shut off valve is used, it should be mounted on the inlet line.

☛ **TIP:** Make the water supply and discharge / return connections with flexible hoses at least 24 in. (61 cm) long. This allows you to easily remove the aftercooler assembly for cleaning.

☛ **TIP:** If an optional flow control is also being installed with the aftercooler, the manual shut off valve should be installed on the inlet line for the flow control.

✎ **NOTE:** Models W600-1000 dryer aftercooler and dry air delivery configuration shown. Location on larger models are different. Refer to the labeling on your dryer.

Aftercooler Outlet

2 **Connect the water discharge or return line with the pressure relief valve to the aftercooler or precooler outlet.** Use the bracket supplied to secure the pressure relief valve to the back of the dryer.

IMPORTANT: Turn the water off when the dryer is not in use to prevent condensation.

Connecting the Intercooler and Optional Precooler (W1600 - 5000)

The intercooler and/or optional precooler require a source of city, tower, or chiller water and a discharge or return line. You can use water at temperatures of 45 to 85°F {7 to 29°C}. But the water flow should be at least 3 gal/min {11.4 liters/min}.
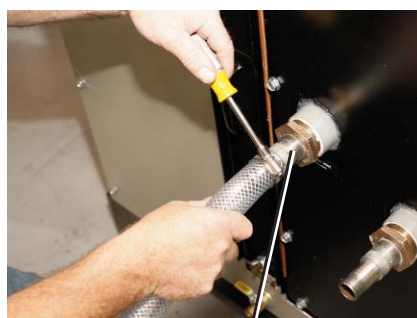
Intercooler Inlet

1 **Connect the water supply line to the intercooler or precooler inlet.** If a manual shut off valve is used, it should be mounted on the inlet line.
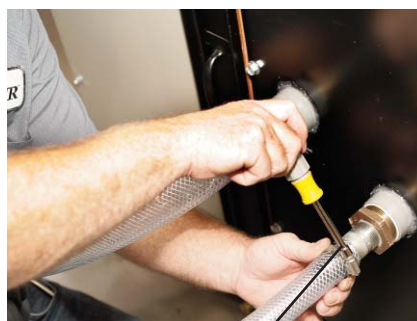
Intercooler Outlet

2 **Connect the water discharge or return line with the pressure relief valve to the intercooler or precooler outlet.** Use the bracket supplied to secure the pressure relief valve to the back of the dryer.

IMPORTANT: Turn the water off when the dryer is not in use to prevent condensation.

Mounting a Loader on the Hopper

If you have a Conair loader or vacuum receiver, you can use the flange and mounting clips provided on the top of the hopper. Refer to the manuals that came with your receiver or loader for detailed installation instructions.
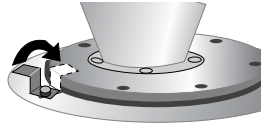
Testing the Installation

You have completed the installation. Now it's time to make sure everything works.

1 **Make sure there is no material in the hopper.** If you have mounted a loader or vacuum receiver on the hopper, disconnect the material inlet hose at the source.

2 **Turn on the main power to the dryer.** Make sure the dryer's disconnect dial is in the ON position. This powers up the control and the display lights will illuminate.
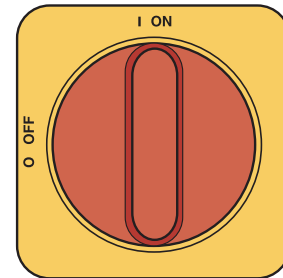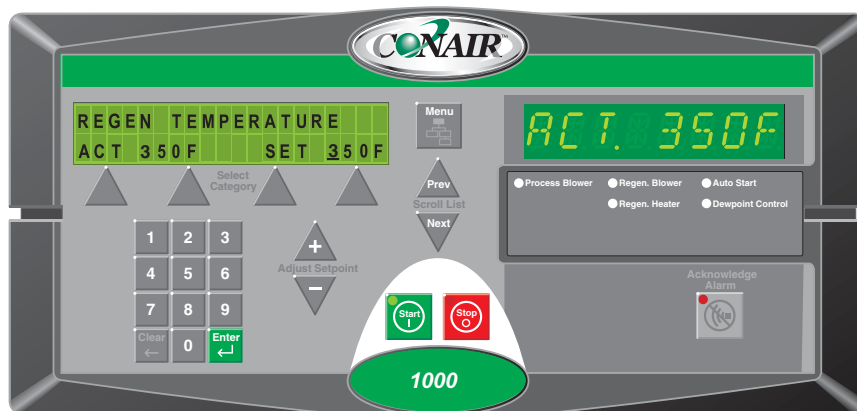
3 **Press the START button.**

  If everything is installed correctly:

  - The green light on the start button will illuminate.
  - The regeneration and process blowers turn on and LEDs will illuminate.
  - The regeneration heater turns on and LED will illuminate.
  - The desiccant wheel starts turning

Testing the Installation

4 **Press the STOP button.**

If everything is installed correctly:

- The blowers will continue running as needed to cool the heaters. (until regeneration heaters are less than 150°F {66°C})

5 **The test is over.** If the dryer performed the normal operating sequences as outlined, you can load the hopper and begin operation. If it did not, refer to the *Troubleshooting section* of the User Guide.

Using Communications

The DeviceNet cable feature is a standard feature on W600-5000 dryers with DC-2 controls. It allows the dryer to be connected your communications network.

If the communications feature will NOT be used for your application, simply coil the cable to keep it out of the way. If the communications feature IS to be used for your application, please refer to the documentation supplied in the Communication Addendum of this manual.

To use the optional SPI, Modbus, Ethernet or standard DeviceNet communications see the Addendum for hardware installation and configuration.

SPI Connection

DeviceNet Connection

Ethernet Connection

Operation

Carousel Plus W Series Dryer: Control Panel DC-2

Screen Title
Alpha-numeric characters display process and alarm conditions.

Menu Button
Press to view the main menu screen where you can select on screen categories or press again to return to the default screen where regeneration temperature and actual setpoint are displayed. This button can be pressed at any time to return to the default screen.

Scroll Buttons
Press to scroll through the closed loop parameter list. The **"Prev"** button scrolls the user up the list, while the **"Next"** button scrolls the user down the list to the last screen and then back to the parameter list title screen at the top.

Select Category
Press to select on-screen categories, paths and options.

Numeric Keypad
Press numbers to enter data.

Clear Button
Press to clear highlighted on-screen data entry fields, only after data has been entered. The clear button clears the field one number at a time.

Status Display
Alpha-numeric characters display process and alarm conditions.

Dryer Status
Illuminated lights show the status of the dryer.
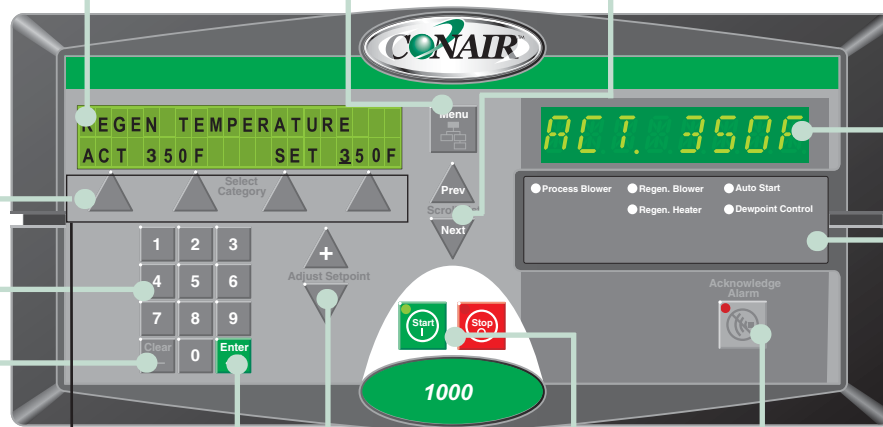
Enter Button
Used to lock-in data entries.

Increment/ Decrement Buttons
Used to increase or decrease values.

Start and Stop Buttons
Press **"Start"** to start the dryer. Press **"Stop"** to stop the dryer.

Acknowledge Alarm Button
Press once to silence the optional audible alarm and display alarm messages. Press again to clear the alarm.

✎ **NOTE**: When changing a setpoint use the Select Category Key directly below the value to be changed. Once pressed the value will blink, then use the keypads or (+) (-) adjustment setpoints to enter the new value. Then press enter for the new value to be recognized.

Carousel Plus W Series Dryer Control Functions

Dryer functions are values that you can set or monitor in the Screen Title and Status Display windows. Press the Menu button then the Scroll List **"Next"** or **"Prev"** buttons until the function you want to set or monitor appears in the Screen Title window.

Control Function Flow Charts

The charts beginning on page 4-4 provide a quick summary of the control functions. For an explanation of each control function, see Control Function Descriptions (page 4-11). The screen numbers correspond with the numbers beside each block in the flow chart.

✎ **NOTE:** In the flow charts of the display screens that follow this page, the grey shaded screens denote optional functions. If the options were not purchased with the dryer, those screens will not appear. Most options can be purchased and installed in the field.

How to Navigate the Menu Tree

To scroll through main menu, use scroll buttons (**"Next"**, **"Previous"**). Push **"Menu"** to access Dryer Main Menu . To access the Status, Setup, Diagnostic and Password screens, use the select category buttons under the digital read-out and then the scroll buttons (**"Next"**, **"Previous"**) to scroll through the parameter lists.

Menu Button

Select Category Buttons

Scroll Buttons

POWER ON

Screen #

```
┌─────────────────────────────┐
│    CONAIR       CP600        │ 1
│  CV00.06.2    DV00.09.8      │
└─────────────────────────────┘
```
3 SEC DELAY

```
┌─────────────────────────────┐
│        MONDAY                │ 2
│  7/22/2003     07:59 AM      │
└─────────────────────────────┘
```
3 SEC DELAY

Central Dryer

```
┌─────────────────────────────┐
│ REGENERATION TEMP            │ 4
│ ACT 350˚F      SET 350˚F     │
└─────────────────────────────┘

┌─────────────────────────────┐
│ RETURN AIR TEMP              │ 5
│ ACT 120˚F      SET 120˚F     │
└─────────────────────────────┘

┌─────────────────────────────┐
│ PROCESS DEWPOINT             │ 11
│ ACT -47˚F       SET -40˚F    │
└─────────────────────────────┘
```

PRESS
MENU
KEY

PRESS MENU KEY
AT ANY TIME

```
┌─────────────────────────────┐
│ DRYER MAIN MENU              │ 12
│ STAT    SETUP    DIAG        │
└─────────────────────────────┘
```

✎ **NOTE:** In the event new control boards are installed, screens showing Process and MDC may be present. The boards will need to be configured for a central dryer. If this is not done, alarms will occur.

Screen #

```
DRYER MAIN MENU
STAT   SETUP   DIAG      12
```

```
DRYER STATUS
PROC  REGEN    OTHER     13
```

CENTRAL DRYER

```
DRYER PROCESS
STATUS SCREENS           14
```

```
RETURN AIR TEMP
ACT 120˚F SET 120˚F      5
```

```
TOTAL RUN HOURS
    1250                 17
```

```
PROCESS CFM 1600         20
```

```
AFTERCOOLER
ENABLED                  21
DISABLED
```

```
AFTERCOOLER
FLOW OFF                 21
FLOW ON
```

```
TOTAL POWER
80 KWH                   23
```

```
PROCESS DEWPOINT
ACT -40˚F  SET -100˚F    11
```

```
PROCESS DEWPOINT
AVERAGE -55˚F            24
```

```
DRYER REGEN
STATUS SCREENS           14
```

```
REGENERATION TEMP
ACT 350˚F    SET 350˚F   4
```

```
REGEN OUTLET TEMP
ACT  280                 29
```

```
REGEN HEATER
OUTPUT 68%               15
```

```
REGEN CURRENT
14.3A   14.4A   14.2A    22
```

```
REGEN POWER
20 KWH                   23
```

```
DRYER OTHER
STATUS SCREENS           14
```

```
MODEL 5000
480 V     60 HZ          30
```

```
DISPLAY FIRM   V2.21.00
DISPLAY MENU  V2.21.00   31
```

```
CONTROL FIRMWARE
VERSION       V2.21.00   32
```

```
AUTOSTART COUNT DOWN
1 DAYS        23:05:53   33
```

```
AUTOSTOP COUNT DOWN
3 DAYS        11:04:23   34
```

```
PANEL INSIDE TEMP
ACT 100˚F                35
```

4 Operation

SCREEN #

```
┌─────────────────────────┐
│ DRYER MAIN MENU         │  12
│ STAT   SETUP   DIAG     │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ DRYER SETUP             │  36
│ PROC  ALM  DISP  OTHER  │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ SETUP PROCESS           │  37
│ PROC    REGN    OTHER   │
└─────────────────────────┘
            │
            ▼
       CENTRAL DRYER
┌─────────────────────────┐
│ SETUP PROCESS           │  38
│ PROC       RETPID       │
└─────────────────────────┘
```

┌─────────────────────────┐
│ SETUP PROCESS   │ 14
│   SCREENS   │
└─────────────────────────┘

┌─────────────────────────┐
│ RETURN AIR TEMP   │ 5
│ ACT 120˚F SET 120˚F   │
└─────────────────────────┘

┌─────────────────────────┐
│ AFTERCOOLER   │ 21
│ Enabled   Edit   │
│ Disabled   │
└─────────────────────────┘

┌─────────────────────────┐
│ PROCESS DEWPOINT   │ 11
│ ACT -40˚F SET-40˚F   │
└─────────────────────────┘

┌─────────────────────────┐
│ SETUP AFTERCOOLER   │ 14
│ on off VALUE SCREENS   │
└─────────────────────────┘

┌─────────────────────────┐
│ RET AIR CYCLE TIME   │ 42
│ COOL 20 SECONDS   │
└─────────────────────────┘

┌─────────────────────────┐
│ RET AIR CALIBRATION   │ 47
│ OFFSET 2˚F   │
└─────────────────────────┘

Screen #

DRYER MAIN MENU
STAT   SETUP   DIAG — 12

DRYER SETUP
PROC ALM DISP OTHER — 36

SETUP PROCESS
PROC   REGEN   OTHER — 37

SETUP REGENERATION
REGEN   PID — 48

SETUP PROCESS
OTHER SCREENS — 14

AUTOSTART TIMER
ENABLED   EDIT — 55
DISABLED

SETUP REGENERATION
SCREENS — 14

SETUP REGEN HEATER
PID VALUE SCREENS — 14

MONDAY START TIME
ON   8:00   AM — 56

REGENERATION TEMP
ACT 350˚F SET 350˚F — 4

REGEN POWER LIMIT
LOW 0% HIGH 100% — 41

MONDAY STOP TIME
OFF   8:00   PM — 57

REGEN OUTLET TEMP
ACT 280 — 29

REGEN CYCLE TIME
2.0 SEC — 42

TUESDAY START TIME
ON   8:00   AM — 56

REGEN TEMP
RANGE 100˚F - 375˚F — 39

REGEN PROBAND
67F — 43

TUESDAY STOP TIME
OFF   8:00   PM — 57

REGEN PID   DONE
AUTOTUNE OFF — 40

REGEN INTERGRAL
25 — 44

WEDNESDAY START TIME
ON   8:00   AM — 56

REGEN CALIBRATION
OFFSET 0˚F — 47

REGEN DERIVATIVE
4 — 45

WEDNESDAY STOP TIME
OFF   6:00   PM — 57

OPT PROCESS DEWPOINT
SAMPLE RATE   150 SEC — 49

REGEN PID RESET
HEAT — 46

THURSDAY START TIME
ON   8:00   AM — 56

OPT PROCESS DEWPOINT
TRIM UP LIMIT   375˚F — 50

REGEN CALIBRATION
OFFSET 0˚F — 47

THURSDAY STOP TIME
OFF   6:00   PM — 57

OPT PROCESS DEWPOINT
TRIM LOW LIMIT   100F — 51

FRIDAY START TIME
ON   8:00   AM — 56

OPT PROCESS DEWPOINT
GAIN   0.7 — 52

FRIDAY STOP TIME
OFF   8:00   PM — 57

OPT PROCESS DEWPOINT
DEAD BAND   1 — 53

SATURDAY START TIME
ON   8:00   AM — 56

OPT PROCESS DEWPOINT
CONTROL   RESET — 54

SATURDAY STOP TIME
OFF   8:00   PM — 57

SUNDAY START TIME
ON   8:00   AM — 56

SUNDAY STOP TIME
OFF   8:00   PM — 57

4
Operation

Screen #

```
DRYER MAIN MENU
STAT   SETUP   DIAG                12

        DRYER SETUP
      PROC  ALM  DISP  OTHER        36
```

```
ALARM        ALARM
ACTION       SETUP              58
```

```
DRYER SETUP CONTROL
DISPLAY SCREENS          14
```

```
DRYER SETUP ALARM
ACTION SCREENS          14
```

```
DRYER SETUP ALARM
SETPOINT SCREENS        14
```

```
       UNITS
STANDARD        EDIT     71
METRIC
```

```
REGN TEMP LOOP BREAK
ON    EDIT   PASS   EDIT    59
```

```
REGEN HIGH TEMP
400°F    5   SEC         60
```

```
TIME DISPLAY
12 HOUR                  72
24 HOUR
```

```
REGN TEMP DEVIATION
ON    EDIT   PASS   EDIT    59
```

```
REGEN LOW TEMP
200°F    5 SEC          60
```

```
DATE          TIME
5/23/2002   Mon  10:33 AM   73
```

```
REGN  HIGH  TEMP ALARM
ON    EDIT   PASS   EDIT    59
```

```
REGEN LOOP BREAK
2°F          40 SEC     61
```

```
REGEN LOW TEMP ALARM
ON    EDIT   PASS   EDIT    59
```

```
REGEN TEMP DEV
10°F     5 SEC          62
```

```
RET MID-HI TEMP ALRM
ON    EDIT   PASS   EDIT    59
```

```
REGEN DIFFERENTIAL
20°F      10 SEC        63
```

```
PROC DEWPOINT ALARM
ON    EDIT   PASS   EDIT    59
```

```
REGEN DIFFERENTIAL
TIME DELAY     5 MIN    64
```

```
FILTER CHECK ALARM
ON    EDIT   PASS   EDIT    59
```

```
RETURN AIR ALARMS
PASS 125°F SHUT 180°F   65
```

```
LOW CFM ALARM
ON    EDIT   PASS   EDIT    59
```

```
RETURN AIR LOOP BRK
3°F       20 SEC        61
```

```
DEWPOINT DEV HIGH
ON    EDIT   PASS   EDIT    59
```

```
CFM LOW SETPOINT
        1               66
```

```
DEWPOINT DEV LOW
ON    EDIT   PASS   EDIT    59
```

```
DEWPOINT ALARM
ACT -20F     180 SEC    67
```

```
WHEEL ROTATION
ON    EDIT   PASS   EDIT    59
```

```
DEWPOINT DEVIATION
HIGH    5°F      30 sec  68
```

```
REGEN BLOWER OVRLOAD
ON    EDIT   PASS   EDIT    59
```

```
DEWPOINT DEVIATION
LOW     5°F      30 sec  69
```

```
MACHINE LOADER ALRM
ON    EDIT   PASS   EDIT    59
```

```
DEWPOINT
TIME DELAY     5 MIN    70
```

```
HOPPER LOADER ALRM
ON    EDIT   PASS   EDIT    59
```

These screens are visible but not functional.

Screen #

DRYER MAIN MENU
STAT   SETUP   DIAG   12

DRYER SETUP
PROC ALM DISP OTHER   36

DRYER SETUP OTHER
OPT INSP COM PW   74

DRYER SETUP OPTIONS
INFORMATION SCREENS   14

DRYER SETUP MODEL
CONFIG SCREENS   14

DRYER SETUP
COMMUNICATIONS   14

Dryer Setup
Password Screen   14

Logging Out
Password …

IF A VALID PASSWORD IS STILL ACTIVE

CFM MONITOR
NOT INSTALLED   EDIT   75

MODEL NUMBER
CP150   EDIT   78

CP15
CP25
CP50
CP75
CP100
CP150
CP200
CP300
CP400
CP600
CP800
CP1000
CP1600
CP2400
CP3200
CP5000

PROTOCOL
MODBUS   EDIT   81

SLAVE ID
1   82

BAUD RATE
19200   EDIT   83

PARITY
NONE   EDIT   84
EVEN
ODD

Enter Password
XXXX   85

Valid Supervisor
Password Entered   87

Invalid Password   85

Logout Supervisor
Password   No   88

IF 2ND AND 4TH
SEL KEYS ARE PRESSED

Change Supervisor
Password   Yes   89

Reset Password

Enter New Password   90

IF CORRECT   86

Supervisor Password
Reset to Default   3 Sec.   86

Enter New Password
1111   90

IF INCORRECT

New Supervisor Pw Is
1111   90

Unknown Password   86

APPEARS FOR
3 SECONDS

APPEARS FOR
3 SECONDS

FILTER CHECK
INSTALLED   EDIT   75

AFTERCOOLER FLOW CONT
INSTALLED   EDIT   75

PRECOOLER
INSTALLED   EDIT   75

REGEN CURRENT TRANS
INSTALLED   EDIT   75

REGEN CURRENT TAP
5A   76
10A
15A

RGN CURRENT SCALE
1   77

DEWPOINT MONITOR
INSTALLED   EDIT   75

DEWPOINT CONTROL
INSTALLED   EDIT   75

PHASE ROTATION
INSTALLED   EDIT   75

MAP INDIRECT REG 500
0   102

MAP INDIRECT REG 501
94   102

MAP INDIRECT REG 502
3   102

MAP INDIRECT REG 503
82   102

MAP INDIRECT REG 504
8   102

MAP INDIRECT REG 505
77   102

MAP INDIRECT REG 506
4   102

MAP INDIRECT REG 507
11   102

MAP INDIRECT REG 508
40   102

MAP INDIRECT REG 509
41   102

MAP INDIRECT REG 510
6   102

MAP INDIRECT REG 511
42   102

MAP INDIRECT REG 512
43   102

MAP INDIRECT REG 513
78   102

MAP INDIRECT REG 514
79   102

MAP INDIRECT REG 515
100   102

MAP INDIRECT REG 516
153   102

MAP INDIRECT REG 517
10   102

MAP INDIRECT REG 518
0   102

MAP INDIRECT REG 519
0   102

MAP INDIRECT REG 530
94   102

MAP INDIRECT REG 531
82   102

MAP INDIRECT REG 532
77   102

MAP INDIRECT REG 533
78   102

MAP INDIRECT REG 534
66   102

MAP INDIRECT REG 535
306   102

MAP INDIRECT REG 536
307   102

MAP INDIRECT REG 537
309   102

Voltage   FREQ
208V   60 HZ   EDIT   80
208V   60 Hz
240V   60 HZ
400V   50 HZ
460V   60 HZ
575V   60 HZ

Display Firm   V9.72.95
Display Menu V2.01.00   31

Control Firmware
Version   V2.01.00   32

Screen #

DRYER MAIN MENU
STAT   SETUP   DIAG   12

Dryer Diagnostic
ALRM   HIST   I/O   91

KEEP 40 SHOWN

NA

DIAGNOSTIC EVENTS
ALRMS ANALOG DIGITAL   94

DIAGNOSTIC I/O
DIGITAL   96

DRYER DIAGNOSTICS
LAST 40 ALARMS   14

00:S-Regen RTD
01/31/00 09:24 P   INFO   92

DOWN
OR UP
ARROW
KEY

01:P-REGEN DEV
2/1/00 03:45A   INFO   92

02:P-REGEN DEV
3/1/00 03:25P   INFO   92

ETC.

SNAPSHOT OF INFO FOR EACH ALARM

Alarm Activated For
10.3 Minutes   93

RETURN AIR TEMP
ACT 120˚F SET 120˚F   93

REGENERATION TEMP
ACT 425˚F SET 425˚F   93

REGEN OUTLET TEMP
ACT 280   93

REGEN HEATER
OUTPUT 68%   93

PROCESS CFM 1500   93

FILTER CHECK
PRES SWT CLOSED   93

PROCESS DEWPOINT
ACT -40F SET -100F   93

AFTERCOOLER
FLOW ON   93

PRECOOLER
FLOW OFF   93

DRYER DIAGNOSTICS
EVENT FREQ SCREENS   14

REGEN HIGH TEMP
S - 0   P - 0   95

REGEN LOOP BREAK
S - 0   P - 0   95

REGEN HEAT BOX HI
S - 0   95

REGEN TEMP DEVIATION
S - 0   P - 0   95

REGEN LOW TEMP
S - 0   P - 0   95

REGEN BLOWER OVERLOAD
S - 0   95

REGEN RTD
S - 0   95

WHEEL ROTATION FAILURE
S - 0   P - 0   95

REGEN OUTLET RTD
S - 0   P - 0   95

RETURN AIR HIGH TEMP
S - 0   95

RET AIR MID-HI TEMP
S - 0   P - 0   95

RETURN AIR RTD
S - 0   P - 0   95

CONTROL WATCHDOG
S - 0   95

EEPROM WRITE ERROR
S - 0   95

PROCESS BLOWER OVERLOAD
S - 0   95

DEWPOINT DEV HIGH
S - 0   P - 0   95

DEWPOINT DEV LOW
S - 0   P - 0   95

PROCESS DEWPOINT
S - 0   P - 0   95

PROC FILTER CLOGGED
S - 0   P - 0   95

CFM LOW
S - 0   P - 0   95

PHASE ERROR
S - 0   95

DRYER DIAGNOSTIC
DIGITAL I/O   14

START DIGITAL I/O
DIAGNOSTICS   OFF   97

PROCESS BLOWER
ON   OFF   JOG   98

REGEN BLOWER
ON   OFF   JOG   98

REGEN HEATER
        JOG   98

WHEEL MOTOR
ON   OFF   JOG   98

REGN HI TEMP SWITCH
OPEN
CLOSED   99

FILTER CHECK SWITCH
OPEN
CLOSED   99

ALARM HORN/LIGHT
ON   OFF   JOG   98

AFTERCOOLER VALVE
ON   OFF   JOG   98

PRECOOLER VALVE
ON   OFF   JOG   98

YELLOW LIGHT
ON   OFF   JOG   98

GREEN LIGHT
ON   OFF   JOG   98

Control Function Descriptions

Screen

Function

SCREEN 1

CONAIR	D100
CV2.21.00	DV2.21.00

Once power is turned on, this screen is displayed for 3 seconds. It shows CONAIR and the dryer type on the first line, and the control program version and display program version on the second line.

SCREEN 2

MONDAY	
07/22/03	07:59 AM

Once power is turned on and screen 1 is displayed for 3 seconds, this screen is displayed for another 3 seconds. It shows the day of the week on the first line and the date and time on the second line. If this information is not correct, it can be changed under the SETUP, DISP, DATE TIME screen 73, page 4-25.

SCREEN 4

REGENERATION TEMP	
ACT 350°F	SET 350°F

Shows the regeneration air setpoint and actual temperature. The setpoint can be changed with the correct password.

✎ **NOTE:** Lowering the regeneration setpoint decreases the capacity of the dryer and normally is not recommended. Use the dewpoint control function instead.

SCREEN 5

RETURN AIR TEMP	
ACT 100°F	SET 100°F

Shows the actual return air temperature measured at the inlet to the process blower. (The return air temperature on W1600-5000 dryers is measured at the inlet to the desiccant wheel. *W1600-5000 dryers designed prior to August 2007,* the return air temperature is measured at the inlet to the process blower.)
If the optional aftercooler/intercooler flow control is installed, a setpoint will be displayed on this screen as well. The setpoint can be changed with the correct password.

Control Function Descriptions(continued)

Screen

Function

SCREEN 11 Dewpoint Control
and/or Dewpoint Monitor

PROCESS DEWPOINT	
ACT -47°F	SET -40°F

This screen will show the actual dewpoint
of the process delivery air measured after
the desiccant wheel and before the process
heater. The dewpoint control will automat-
ically adjust the regeneration temperature
to maintain the dewpoint setpoint.
Dewpoint control is not active with -40°F
{-40°C} setpoint. See screen 24, page
4-15 for information about using the
dewpoint control or monitor.

✎ **NOTE:** Dewpoint actual will not be live for
approximately 5 to 8 minutes.

SCREEN 12 (MAIN MENU)

DRYER MAIN MENU		
STAT	SETUP	DIAG

This is the dryer MAIN MENU. It can be
located by pressing the **"MENU"** key
while at the DEFAULT screen. By press-
ing the Select Category buttons under the
titles, the user goes to STATUS screens,
SETUP screens, or DIAGNOSTIC
screens.

Control Function Descriptions (continued)

Screen

SCREEN 13

DRYER STATUS		
PROC	REGEN	OTHER

SCREEN 14

DRYER PROCESS
STATUS SCREEN

Function

This is the Dryer Status screen. It can be found by pressing the Select Category button under the word "Stat" on the Main Menu screen 12. Any information under the status section is read only; NO CHANGES can be made from the status sections. The operator can select to see status information for Process, Regeneration, or Other.

This is a column title screen. To navigate to screens within a column (reference the flow charts beginning on page 4-4), the operator must use the scroll buttons, **"Prev"** or **"Next"**. The **"Next"** button will scroll one screen at a time down a list of screens. Once the last screen in the list is displayed the **"Next"** button will return the operator back to this Title screen. When the **"Prev"** button is pressed, it will scroll one screen at a time up the list of screens. Once the title screen is displayed the **"Prev"** button will go up to the next high screen, in this case the Dryer Status screen 13.

Control Function Descriptions(continued)

Screen

SCREEN 17

| TOTAL RUN HOURS |
| 1250 |

SCREEN 20

PROCESS CFM 1600

SCREEN 21 (Aftercooler/
Intercooler Flow Control Option)

AFTERCOOLER
ENABLED

SCREEN 21 (Aftercooler/
Intercooler Flow Control Option)

AFTERCOOLER
FLOW ON

Function

This screen shows the total run time in hours the dryer has been running since it was new. If the control board is changed during the life of the dryer, this timer will start over.

This is the CFM Monitor screen. It displays the Process CFM. The Process CFM is measured by a differential pressure transducer across the inlet and the outlet of the process blower. The CFM Monitor option must be installed **(see screen 75, page 4-26, also see note on this page)** for this to appear.

This screen shows if the aftercooler/intercooler flow control option is enabled. If the aftercooler/intercooler is disabled, there will be no setpoint for the Return Air Temperature screen 5. The aftercooler/intercooler flow control option must be installed **(see screen 75, page 4-26, also see note on this page)** for this to appear.

This screen shows if the control is opening the solenoid valve. The aftercooler/intercooler flow control option must be installed **(see screen 75, page 4-26, also see note this on page)** for this to appear.

Control Function Descriptions (continued)

Screen

Function

SCREEN 22 (Current Monitor Option)

REGEN CURRENTS		
84.3 A	84.2 A	84.3 A

This screen shows the measured current on each leg of the 3-phase power going to the regeneration heater. The Regeneration Current Monitor option **(see screen 75, page 4-26, also see note on this page)** for this to appear.

✎ **NOTE:** Additional components required for installation.

SCREEN 23 (Current Monitor Option)

TOTAL POWER
82 KWH

This screen shows the calculated total power for the dryer. The calculation includes the measured current for the regeneration heaters, the control voltage set for the dryer, and pre-determined power consumption values for the blowers and the control. The Current Monitor option **(see screen 75, page 4-26, also see note on this page)** for this to appear.

✎ **NOTE:** Additional components required for installation.

✎ **NOTE:** Screens **labeled 75** in the display screen flow chart on page 4-9 are various option installation screens.

SCREEN 24 Dewpoint Control and Dewpoint Monitor

DEWPOINT CONTROL	
AVG	-55°F

This screen displays the average dewpoint over the last hour of run time.

SCREEN 29 (Regeneration Outlet Temperature)

REGEN OUTLET TEMP
ACT 280

This screen shows the actual temperature measured at the regeneration outlet of the desiccant wheel manifold.

Control Function Descriptions (continued)

Screen

Function

SCREEN 30

MODEL	CP600-5000
480 V	60 Hz

This screen shows the model number, voltage, and frequency for which the dryer control is setup. These values can be changed with the proper password on screen 85, see page 4-27 (screen 80) under SETUP, OTHER, INSP, Model number (screen 78), and Voltage FREQ (screen 80).

➡ **Tip:** This information is important to know when ordering a control board.

SCREEN 31

DISPLAY FIRM	V2.21.00
DISPLAY MENU	V2.21.00

This screen shows the current versions of program for the Display Firmware and Menus.

➡ **Tip:** This information is important to know when ordering a display board.

SCREEN 32

CONTROL FIRMWARE	
VERSION	V2.21.00

This screen shows the current versions of program for the Control Firmware.

SCREEN 33

AUTOSTART COUNT DOWN	
1 DAYS	23:05:53

If the dryer is set with an auto start time, this screen will appear and show the amount of time remaining before the dryer will automatically start. The LED on the front of the display, beside the word Auto Start, will flash if the dryer is set to start automatically. The auto start feature can be programmed under SETUP, PROC, PROC, OTHER (screens 55 and 56, pages 4-20 and 4-21). The dryer can be set to automatically start each day.

SCREEN 34

AUTOSTOP COUNT DOWN	
3 DAYS	11:04:23

If the dryer is set to auto stop, this screen will appear and show the amount of time remaining before the dryer will automatically stop. The auto stop feature can be programmed under SETUP, PROC, OTHER (screens 55 and 57, pages 4-20 and 4-21). The dryer can be set to automatically stop each day.

Control Function Descriptions(continued)

Screen

Function

SCREEN 35

| PANEL INSIDE TEMP |
| ACT 100°F |

This screen shows the temperature inside the control enclosure. It is measured at the lower right corner of the control board.

SCREEN 36

| DRYER SETUP | | | |
| PROC | ALM | DISP | OTHER |

This is the Dryer Setup screen. It can be found by pressing the Select Category button under the word Setup on the Main Menu (screen 12). By pressing the Select Category buttons under the titles, the user can select to see setup information for Process, Alarms, Display, or Other.

SCREEN 37

| SETUP PROCESS | | |
| PROC | REGEN | OTHER |

This is the Setup Process screen. It can be found by pressing the Select Category button under the word "PROC" on the Dryer Setup (screen 36). By pressing the Select Category buttons under the titles, the user can select to see setup information for Process, Regeneration, or Other.

SCREEN 38

| SETUP PROCESS | |
| PROC | RETPID |

This is the second Setup Process screen. It can be found by pressing the Select Category button under the word "PROC" on the Setup Process screen (37). By pressing the Select Category buttons under the titles, the user can select to see setup information for Process or Return Air PID if the optional aftercooler/intercooler flow control is installed.

4
Operation

Control Function Descriptions(continued)

Screen

SCREEN 40

PROCESS PID	DONE
AUTOTUNE	OFF

and

REGEN PID	DONE
AUTO	

Function

Before performing an autotune, set the setpoint to the desired temperature you would like the control to autotune to at screen 3 for process, and screen 4 for regeneration. Screen 40 shows the auto-tune function for the selected heater. The dryer must not be running to initiate an autotune. The autotune should be started from a cold start or a minimum of 50ºF {28ºC} difference between starting and autotune temperatures. With the proper password, (see page 4-29, screen 85) press the Select Category button under the word Off. Once selected, the word should start to blink. Press the (+) or (-) button to tog-gle the Off to On and then press the **"ENTER"** key to start the autotune. The display will show " Wait", then "Heat", then " Done" when it is complete. Pressing **"STOP"** during an autotune will cancel the autotune and not change PID values. The PID values can be set back to factory defaults by going to the Reset (screen 46).

SCREEN 41

REGEN POWER LIMIT	
LOW 2%	HIGH 80%

This screen shows the power output range for the heater. It is set by default to 0% for the low and 100% for the high.

SCREEN 42

REGEN CYCLE TIME
HEAT 2.0 SECONDS

This screen shows the PID cycle time for the heater "Heat", or with a precooler "Cool". This time value is the time for one on/off cycle. For example, with a heater running at 50% and the cycle time set at 2 seconds, the heater would be on 1 second and off 1 second.

SCREEN 43

REGEN PROP BAND
HEAT/COOL 30°F

This screen shows the Proportional Band value for the PID loop.

Control Function Descriptions(continued)

Screen

Function

SCREEN 44

REGEN INTEGRAL	
HEAT/COOL	16.0

This screen shows the integral value for the PID Loop.

SCREEN 45

REGEN DERIVATIVE	
HEAT/COOL	2.0

This screen shows the derivative value for the PID Loop.

SCREEN 46

REGEN PID RESET
HEAT/COOL

With the proper password, (see page 4-29, screen 85) the PID values can be reset back to the factory default settings.

SCREEN 47

REGEN CALIBRATION	
OFFSET	2°F

This screen shows the temperature offset for the RTD. This screen is used if the regeneration readout needs to be calibrated.

SCREEN 48

SETUP REGENERATION	
REGEN	PID

This is the Setup Regeneration screen. It can be found by pressing the Select Category button under the word "Regen" on the Setup Process screen (37). By pressing the Select Category buttons under the titles, the user can select to see setup information for Regeneration or Regeneration PID.

SCREEN 49

PROCESS DEWPOINT	
SAMPLE RATE	150 SEC

This is the amount of time the control waits before checking the dewpoint value after making a change. This time value gives the system time to respond to a process change.

✎ **NOTE:** Screens 49, 50, 51, 52, 53 and 54 apply only when the dewpoint control is enabled.

Control Function Descriptions (continued)

Screen

Function

SCREEN 50

PROCESS DEWPOINT	
TRIM UP LIMIT	375°F

This is the maximum value the dewpoint control can set the regeneration temperature to achieve the desired dewpoint.

SCREEN 51

PROCESS DEWPOINT	
TRIM LOW LIMIT	100°F

This is the minimum value the dewpoint control can set the regeneration temperature to achieve the desired dewpoint.

SCREEN 52

PROCESS DEWPOINT	
GAIN	0.7

This is the proportional gain value for the dewpoint control.

SCREEN 53

PROCESS DEWPOINT	
DEADBAND	1

This is the deadband range. If the actual dewpoint value is within this range of the dewpoint setpoint, the control will not make a change to the regeneration temperature.

SCREEN 54

PROCESS DEWPOINT
CONTROL RESET

This will reset the dewpoint control back to the factory default values.

SCREEN 55

AUTO START TIMER	
ENABLED	EDIT

This screen is used to enable or disable the auto start function. If the function is enabled, the dryer can be started or stopped once each day. The start and stop times can be set on screens 56 and 57 (page 4-21). The auto start can be enabled or disabled with the proper password (screen 85, page 4-29).

Control Function Descriptions (continued)

Screen

Function

SCREEN 56

MONDAY START TIME
ON   8:00 AM

This is the auto start screen for the first day of the week. Each day has a screen similar to this. By pressing the Select Category button under On or Off, the dryer can be set to start on Monday. The start time can be set by pressing the Select Category button under time and entering a new time on the numeric keypad. The AM / PM can be changed only after a time value has been entered. The (+) button will set PM and the (-) button will set AM. The **"ENTER"** key must be pressed to lock in the new time. The dryer can be manually started at anytime. If the auto start time runs out and the dryer has been manually started, nothing will happen.

✎ **NOTE:** Screens 56 and 57 require the supervisor's password.

SCREEN 57

MONDAY STOP TIME
ON   8:00 PM

This is the auto stop screen for the first day of the week. Each day has a screen similar to this. By pressing the Select Category button under On or Off, the dryer can be set to stop on Monday. The stop time can be set by pressing the Select Category button under time and entering a new time on the numeric keypad. The AM / PM can be changed only after a time value has been entered. The (+) button will set PM and the (-) button will set AM. The **"ENTER"** key must be pressed to lock in the new time. If the auto stop time runs out and the dryer has already been manually stopped, nothing will happen. If the dryer was auto started on Monday morning and the Monday auto stop is set to off, the dryer will continue running until it hits a day of the week when the auto stop is set to On. At that time the dryer will turn off.

Control Function Descriptions (continued)

Screen

Function

SCREEN 58

```
ALARM               ALARM
ACTION              SETUP
```

This is the alarm action and setup screen. With the proper password, (see page 4-29, screen 85) the Select Category button can be pressed under Alarm Action or Alarm Setup. Alarm Action screens can be used to change whether an alarm is Off, Passive, or Shutdown (screen 59). Alarm Setup screens can be used to change alarm setpoints and delay times. (screens 60-70)

SCREEN 59

```
REGEN TEMP DEVIATION
ON      EDIT    PASS    EDIT
```

This is an example of the Alarm Action screens. With the proper password, (see page 4-29, screen 85) some alarms can be turned on or off by either pressing the Select Category button under the word Edit, or by pressing the Select Category button under the word On or Off. Once the word begins to blink, the (+) or (-) keys will change the setting. The **"ENTER"** key must be pressed to lock in the value. The same sequence works for the "Pass" or "Shut" words. "Pass" or Passive means the alarm will not shut the dryer down but the alarm will be logged in the Dryer Diagnostics Alarm Log. A "Shut" means Shutdown, in which case the dryer would shut down if the alarm occurs.

SCREEN 60

```
REGEN HIGH TEMP
250°F    1 SEC
```

This is an example of an Alarm Setup screen that has a minimum or maximum temperature. With the proper password, (see page 4-29, screen 85, refer to password) the temperature setpoint can be changed as well as how long the dryer has to stay at that temperature before alarming.

Control Function Descriptions (continued)

Screen

Function

SCREEN 61

```
REGEN LOOP BREAK
2°F                  40 SEC
```

This is an example of an Alarm Setup Loop Break screen. When actual temperature is outside the deviation band, if the temperature is not moving toward the setpoint at a rate greater than or equal to X°F over Y seconds, then the dryer will alarm on Loop Break. Once the actual temperature is within the deviation band, the Loop Break is ignored.

SCREEN 62

```
REGEN TEMP DEV
10°F                  5 Sec
```

This is an example of an Alarm Setup deviation screen. If the actual temperature goes outside this temperature band (High or Low) for a set amount of time, the dryer will give a deviation alarm. With the proper password (see page 4-29, screen 85), these values can be changed.

SCREEN 63

```
REGEN DIFFERENTIAL
20°F                  10 SEC
```

This set value is the minimum difference between the regeneration inlet and outlet temperature for the wheel rotation alarm. Once this difference is reached for the set time value, the dryer will alarm wheel rotation failure.

SCREEN 64

```
REGEN DIFFERENTIAL
TIME DELAY           5 MIN
```

This is a delay time from start-up so regeneration can come up to temperature.

SCREEN 65

```
RETURN AIR ALARMS
PASS 150°F        SHUT 180°F
```

This screen shows the return air temperatures at which the dryer will give a passive alarm, and when the dryer will shutdown on High Return Air Temp.

Control Function Descriptions(continued)

Screen

SCREEN 66 (CFM Monitor Option)

```
CFM LOW SETPOINT
    1430
```

SCREEN 67 (Dewpoint Monitor or Dewpoint Control)

```
DEWPOINT ALARM
ACT -40°F         180 SEC
```

SCREEN 68 (Dewpoint Control Enabled)

```
DEWPOINT DEVIATION
HIGH      5°F       30 SEC
```

SCREEN 69 (Dewpoint Control Enabled)

```
DEWPOINT DEVIATION
LOW 5°F            30 SEC
```

Function

This screen shows the low CFM setpoint. The default is 1 CFM. The default can be changed with the proper password (see page 4-29, screen 85).

This screen shows the alarm setpoint for a Dewpoint alarm. With the proper password, it can be changed (see page 4-29, screen 85). The defaults are -3°F for 180 seconds. If the control senses -3°F or higher for 180 seconds, the dryer will alarm.

This is the dewpoint high deviation alarm value. With the proper password, it can be changed (see page 4-29, screen 85). When in dewpoint control, if the actual dewpoint goes above the setpoint in screen 11, page 4-12, for the set amount of time, the dryer will alarm "Dewpoint Deviation High".

This is the dewpoint low deviation alarm value. With the proper password, it can be changed (see page 4-29, screen 85). When in dewpoint control, if the actual dewpoint goes below the setpoint in screen 11, page 4-12, by this value for this amount of time, the dryer will alarm "Dewpoint Deviation Low".

Control Function Descriptions(continued)

Screen

Function

SCREEN 70

```
DEWPOINT

TIME    DELAY          5 MIN
```

This is the amount of time from start-up the dryer is allowed to run before the control will try to control the dewpoint. Five minutes is the default. This gives the dryer time to warm up and reach a steady state. It can be changed with the proper password (see page 4-29, screen 85).

SCREEN 71

```
UNITS

STANDARD              EDIT
```

This screen shows the units the dryer will display. It can be changed with the proper password (see page 4-29, screen 85) to either Standard or Metric. Press the Select Category button below the word Edit to change the setting and press the **"ENTER"** key to lock in the value.

SCREEN 72

```
TIME DISPLAY

12 HOUR
```

This screen shows the time unit the dryer will display. It can be changed with the proper password (see page 4-29, screen 85) to either 12 hour (AM / PM Clock) or 24 hour (Military Time). Press the Select Category button below the words 12 hour to change the setting and press the **"ENTER"** key to lock in the value.

SCREEN 73

```
DATE              TIME

10/25/2004 MON    10:33 AM
```

This screen shows the date and time. With the proper password, (see page 4-29, screen 85) the date and time can be changed.

4
Operation

Control Function Descriptions(continued)

Screen

Function

SCREEN 74

```
DRYER SETUP OTHER

OPT     INSP     COM     PW
```

This is the Dryer Setup Other screen. It can be found by pressing the Select Category button under the word Other on the Dryer Setup Screen (36). By pressing the Select Category buttons under the titles, the user can select to see setup information for Options, Inspection, Communications, or Password.

✎ **NOTE:** Screens labeled 75 in the display screen flow chart on page 4-9 are various option installation screens.

SCREEN 75

```
CFM MONITOR

NOT INSTALLED          EDIT
```

This is an example of an Option Installation screen. With the proper password (see page 4-29, screen 85) and hardware installed, an option can be turned on by pressing the Select Category screen under the word Edit. This will change an option from Not Installed to Installed. The **"ENTER"** key must be pressed to lock in the change. Once an option is installed, there may be additional screens that show in the menu structure that need to be setup.

SCREEN 76 (Current Monitor Option)

```
REGEN CURRENT          TAP

5 A
```

This screen is used with the current monitor option and tells the control which tap is used on the current sensing board (5A, 10A, or 15A).

SCREEN 77 (Current Monitor Option)

```
REGEN CURRENT SCALE

1
```

This screen is used with the current monitor option and is used to scale the reading to the proper reading.

Control Function Descriptions(continued)

Screen

Function

SCREEN 78

```
MODEL NUMBER
CP600                    EDIT
```

This screen further defines the dryer type to a model number. Based on the dryer type, the selections on this menu will change. Your dryer should be configured from the factory. However, if the control was replaced, the control may need to be reconfigured. With the proper password, (see page 4-29, screen 85) the Model Number can be changed by pressing the Select Category button under the word Edit. The **"ENTER"** key must be pressed to lock in the selection.

SCREEN 80

```
VOLTAGE      FREQ
208 V        60 HZ       EDIT
```

This screen defines the voltage and frequency at which the dryer will be running. This setting should match the electrical label on the side of the control box. Your dryer should have been configured from the factory. However, if the control was replaced or the dryer was configured to run on another voltage, this screen may need to be reconfigured. With the proper password, (see page 4-29, screen 85) the Voltage and Freq can be changed by pressing the Select Category button under the word Edit. The **"ENTER"** key must be pressed to lock in the selection.

Control Function Descriptions(continued)

Screen

Function

SCREEN 81 Communications

```
PROTOCOL
DEVICENET              EDIT
```

This screen shows the communications protocol. Modbus, DeviceNet, Ethernet or SPI is available. This is set at the factory. If adding to an existing dryer, the communications protocol can be changed with the proper password (see page 4-29, screen 85).

SCREEN 82 Communications

```
SLAVE ID
      1                EDIT
```

This screen shows the Slave ID number. The ID number can be changed with the proper password (see page 4-29, screen 85) by pressing the Select Category button below the word Edit and entering a value on the keypad or scrolling to the desired value using the Adjust Setpoint keys. The **"ENTER"** key needs to be pressed to lock in the new number.

SCREEN 83 Communications

```
BAUD RATE
9600                   EDIT
```

This screen shows the baud rate. The baud rate can be changed with the proper password (see page 4-29 screen 85). Press the Select Category key below the word Edit and enter a value on the keypad or scroll to the desired value using the Adjust Setpoint keys.

SCREEN 84 Communications

```
PARITY
NONE                   EDIT
```

This screen shows the parity. The parity can be changed with the proper password (see page 4-29, screen 85) to Even, Odd, or None by pressing the Select Category button below the word Edit. The **"ENTER"** key needs to be pressed to lock in the new number.

Control Function Descriptions(continued)

Screen

Function

SCREEN 85

```
ENTER PASSWORD
0210
```

This screen shows the password entry screen. You can enter a password by using the keypad. Once a password has been entered the **"ENTER"** key must be pressed. If the password is valid, the display will show screen 87. If the password was incorrect, it will display "Invalid Password Try Again" and go back to the Enter Password screen. The default supervisor password is 0210. The supervisor can change this password by going to screen 89.

SCREEN 86

```
RESET PASSWORD
```

This is the Reset Password screen. It will only be shown when the second and fourth Select Category buttons are pressed at the same time when at screen 85. You can enter the default password by using the keypad. Once the default password has been entered, the **"ENTER"** key must be pressed. This will change the password back to the factory default password (see page 4-29, screen 85). If the password has been changed see screens 89 and 90.

SCREEN 87

```
VALID SUPERVISOR
PASSWORD ENTERED
```

This is the display screen that appears when a valid password has been entered. Pressing the Previous button will take you to screen 14. Pressing **"Next"** will take you to screen 88.

Control Function Descriptions(continued)

Screen

Function

SCREEN 88

```
┌─────────────────────────────┐
│ LOGOUT SUPERVISOR           │
│                             │
│ PASSWORD            YES     │
└─────────────────────────────┘
```

This is the password logout screen. If nothing is done, the password will automatically be logged out after 30 minutes. To logout, use the Select Category button under the word Yes/No. Setting it to Yes and hitting the **"ENTER"** Key will change the display to "Logging Out Password" for 3 seconds then will automatically go to screen 14.

SCREEN 89

```
┌─────────────────────────────┐
│ CHANGE SUPERVISOR           │
│                             │
│ PASSWORD            YES     │
└─────────────────────────────┘
```

This screen allows the supervisor to change the password. To change the password, use the Select Category button under the word, Yes/No. Setting it to yes and hitting the **"ENTER"** Key will change the display to screen 90. If the user does not want to change the password, by pressing the **"Next"** key the control will return to the Dryer Setup Password screen 14.

SCREEN 90

```
┌─────────────────────────────┐
│ ENTER NEW PASSWORD          │
│                             │
└─────────────────────────────┘
```

This screen shows the password entry screen. You can enter a new password by using the key pad. Once a new password has been entered the **"ENTER"** key must be pressed. The display will show the new password for 3 seconds then return to the Change Supervisor Password (screen 89). To exit, press the **"Next"** key and the control will return to the Dryer Setup Password Screen.

SCREEN 91

```
┌─────────────────────────────┐
│ DRYER DIAGNOSTIC            │
│                             │
│ ALRM         HIST      I/O  │
└─────────────────────────────┘
```

This is the Dryer Diagnostic screen. It can be found by pressing the Select Category button under the word Diag on the Dryer Main Menu screen 12. By pressing the Select Category buttons under the titles, the user can select to see diagnostic information for Alarms, Alarm History, or Inputs and Outputs.

Control Function Descriptions (continued)

Screen

Function

SCREEN 92

```
00:S-REGEN RTD
1/31/00  09:24 P          INFO
```

This is an example of one of the alarm history screens. The first two numbers of the first line show what alarm you are viewing in the list. This example is the first alarm in the list 00. The letter after the : P or : S shows if the alarm was a passive or shutdown alarm. The second line shows the date and time when the alarm occurred. By pressing the Select Category button under the word Info, the display can show a number of screens that are a snapshot of information that was happening when the alarm occurred.

SCREEN 93

```
ALARM ACTIVATED FOR
10.3 MINUTES
```

This is an example of one of the Information screens for an alarm. This is the first screen under the Info shown on screen 92. It shows how long the alarm was active. The time shown is from when the alarm occurred until the alarm was acknowledged and cleared. The **"Next"** button can be pressed while at this screen to see other items in the list of snapshot info that was happening when the alarm occurred.

SCREEN 94

```
DIAGNOSTIC EVENTS
ALARMS
```

This is the Dryer Diagnostic screen. It can be found by pressing the Select Category button under the word Hist on the Dryer Diagnostics screen (91). By pressing the Select Category buttons under the alarms, the user can select to see diagnostic information for Alarms.

SCREEN 95

```
REGEN HIGH TEMP
S - 0                     P - 0
```

This is an example of the Event Freq. screens. This shows the number of times an alarm has occurred. By pressing the next key in this section, the user can see info for all alarms. The "S" indicates how many times it was a shutdown alarm and the "P" indicates how many times it was a passive alarm.

4
Operation

Control Function Descriptions(continued)

Screen

Function

SCREEN 96

| DIAGNOSTIC I/O |
| DIGITAL |

This is the Diagnostic I/O screen. It can be found by pressing the Select Category button under the word I/O on the Dryer Diagnostics screen (91). By pressing the Select Category button under Digital, the user can access the digital outputs (screen 98) and view the status of the digital inputs (screen 99). The analog diagnostic I/O function is not used.

SCREEN 97

| START DIGITAL I/O | |
| DIAGNOSTICS | OFF |

This screen is used to enter the diagnostic mode where outputs can be turned on (screen 98) or the state of the inputs monitored (screen 99). Note that the dryer MUST NOT BE running to enter diagnostics. The supervisor password is necessary (screen 85, page 4-29).

SCREEN 98

| PROCESS BLOWER | | |
| ON | OFF | JOG |

This is an example of one of the digital outputs that can be manually energized. All screens in this section only work when the dryer is not running and is in "standby". The outputs can be turned on, turned off, or energized for a 3-second jog (automatically turned on for 3 seconds then turned off). The process and regeneration heaters can only be jogged for 3 seconds, and the wheel motor, if jogged, will rotate the wheel for 3 seconds. If the stop button is pressed at any time during this testing, the output will stop immediately.

SCREEN 99

| PROC |
| OPEN |

This is an example of one of the digital Inputs screens. This will show if the input is open or closed.

Control Function Descriptions_(continued)

Screen

SCREEN 102

```
MAP INDIRECT REG 500
       0
```

Function

These parameters map which internal variables are accessible from the user communication port on the DC-2 operator display. A default set of variables has been chosen that represent the most important variables for the majority of uses. These values should NOT be changed except under the direction of Conair Engineering or Service.

To Start Drying
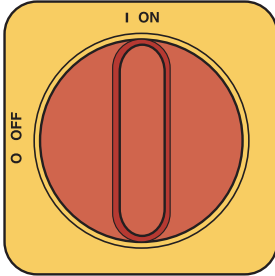
1 **Make sure there is material in the hopper.**

2 **Turn on the main power to the dryer**. Make sure the dryer's disconnect dial is in the ON position. This powers up the control and the display lights will illuminate.

✎ **NOTE**: When changing a setpoint use the Select Category Key directly below the value to be changed. Once pressed the value will blink, then use the keypads or (+) (-) adjustment setpoints to enter the new value. Then press enter for the new value to be recognized.

✎ **NOTE:** Once the dryer has been started, go to the ResinWorks or HTC and set the setpoint then turn on the unit.

Select
Category
Buttons

Setpoint
Adjustment
Buttons
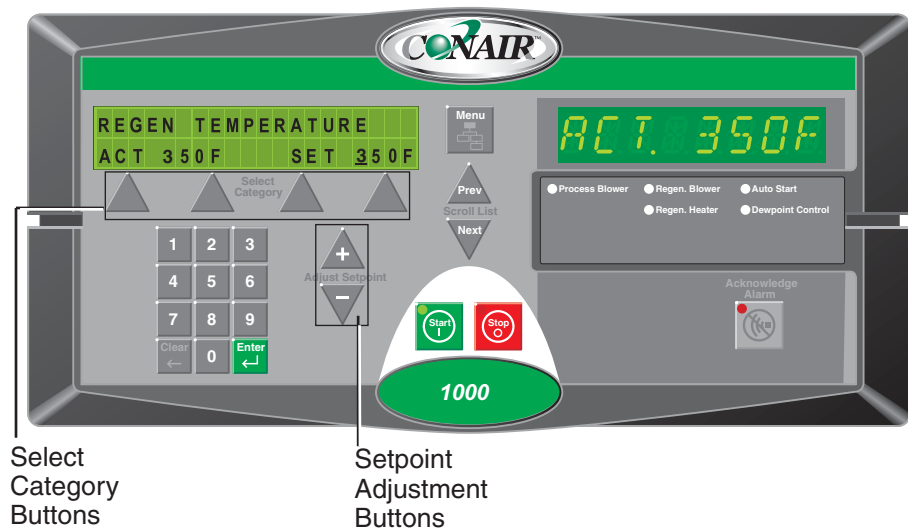
To Start Drying (continued)

3 **Press the START button.**

If everything is installed correctly:

- The green light on the start button will illuminate.
- The process and regeneration blowers turn on and the display LEDS will illuminate.
- The regeneration heater turns on and the display LED will illuminate.
- The desiccant wheel starts turning.

To Stop Drying

✎ **NOTE:** Turn off the ResinWorks or HTC and allow the heaters to cool (3 to 5 minutes) before turning off the dryer.

1 **Press the STOP button.** The Stop LED blinks red.

- The blowers continue running for a few minutes to cool the heaters.

2 **Be sure to disconnect and lockout the main power** if you have stopped the dryer to perform maintenance or repair.

IMPORTANT: Do not use the main power switch to stop the dryer. Turning off power to the control and dryer during normal operation prevents the necessary cool-down period, and can trigger the shut down/high temperature alarm during your next drying cycle.

⚠ **Caution:** Improper shut down can cause damage to your dryer.
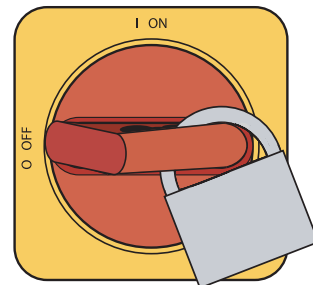
How to Use the Supervisor's Password

The supervisor's password must be entered before you can use or make changes to some screens on the dryer control. To enter the supervisor password:

1 **Go to screen 12 and press the Select Category button** under "SET UP."

```
┌─────────────────────────────────┐
│         DRYER MAIN MENU          │
│                                  │
│ STAT     SETUP        DIAG       │
└─────────────────────────────────┘
```

2 This will take you to screen 36. **On Screen 36, press the Select Category button** under "other."

```
┌─────────────────────────────────┐
│          DRYER SETUP             │
│                                  │
│ PROC     ALM      DISP    OTHER  │
└─────────────────────────────────┘
```

3 This will take you to screen 74. **On Screen 74, press the Select Category button** under "PW."

```
┌─────────────────────────────────┐
│ DRYER SETUP OTHER                │
│                                  │
│ OPT      INSP      COM      PW   │
└─────────────────────────────────┘
```

4 This will take you to screen 14. **On Screen 14, press the Scroll List Next button**. This will take you to screen 85.

```
┌─────────────────────────────────┐
│         DRYER PROCESS            │
│         STATUS SCREEN            │
├─────────────────────────────────┤
│ ENTER PASSWORD                   │
│ 0210                             │
└─────────────────────────────────┘
```

5 **This is the screen where you will need to enter the supervisor's password.** The default supervisory password in 0210. Enter this number to make changes to screens where the supervisor's password is necessary to use or change a function of the dryer.

<div align="right">(continued)</div>

How to Use the Supervisor's
Password (continued)

Be sure to push **"ENTER"** after entering the password. If the password is entered successfully, screen 87 will be displayed.

```
VALID SUPERVISOR
PASSWORD ENTERED
```

Once the desired parameter has been changed, follow the previous steps to go to screen 88.

```
LOGOUT SUPERVISOR
PASSWORD              YES
```

Push the Select Category button under "No". Once it begins to flash, push either the Adjust Setpoint button to display "Yes", then push **"ENTER"**. Push the Menu button to return to the main display.

✎ **NOTE:** The supervisor's password can be changed by going to screen 89, see page 4-4, for the map of the screens. See page 4-30, screen 89 for additional information on changing the supervisory password.

Using the Dewpoint Monitor and Dewpoint Control

Your dryer is equipped with a dewpoint monitor and dewpoint control features. You can choose to use it as a monitor only device, or to maintain a steady dewpoint that you select with the dewpoint control. Dewpoint control will vary the regeneration air temperature to condition the desiccant to the level necessary to maintain the desired dewpoint.

Dewpoint Monitor

✎ **NOTE:** The supervisor's password is necessary. Please refer to the "Using the Supervisor's Password" section on page 4-36.

From "Dryer Main Menu", select "Setup, Other OPT" to get to the "Dryer Setup Options Information" (screen 14, page 4-13). Proceed to screen 75 (page 4-26). "Dewpoint Monitor" must be set to "Installed" and "Dewpoint Control" set to "Not Installed". Screen 11 (page 4-12) will display the actual dewpoint readout.

Dewpoint Control

✎ **NOTE:** The supervisor's password is necessary. Please refer to the "Using the Supervisor's Password" section on page 4-36.

From "Dryer Main Menu", select "Setup, Other OPT" to get to the "Dryer Setup Options Information" (screen 14, page 4-13). Proceed to screen 75 (page 4-26). "Dewpoint Control" must be set to "Installed". "Dewpoint Monitor" can be set to "Installed" or "Not Installed". Screen 11 (page 4-12) will display the actual dewpoint and the dewpoint setpoint the dryer is to maintain.

✎ **NOTE:** Dewpoint control is inactive when the dewpoint setpoint is -40° F {-40° C}.

✎ **NOTE:** For more information concerning specific dewpoint control screens, see Control Function Descriptions, page 4-11.

Using the Auto Start Timer

You can set the dryer to start and stop automatically using the Auto Start and Auto Stop functions. Supervisor Password (screen 85, page 4-29) is necessary to use this function.

Programming Auto Start

The Auto Start time and day can be programmed using the Auto Start Countdown screen. This screen can be accessed under the SETUP, PROC, and OTHER screens **from the "Dryer Main Menu" screen 12:**

SCREEN 36

Dryer Setup			
Proc	Alm	Disp	Other

SCREEN 37

Setup Process		
Proc	Regen	Other

SCREEN 56

MONDAY START TIME	
ON	8:00 AM

Once the Auto Start time and day has been programmed, the Auto Start Countdown screen (screen 33) will show the amount of time remaining before the dryer will automatically start. The LED on the front of the display beside the word Auto Start will flash if the dryer is set to start automatically. The dryer can be set to automatically start each day.

Programming Auto Stop

The Auto Stop time and day can be programmed using the Auto Stop Countdown screen. This screen can be accessed under the SETUP, PROC, and OTHER screens **from the "Dryer Main Menu" screen 12:**

SCREEN 36

Dryer Setup			
Proc	Alm	Disp	Other

SCREEN 37

Setup Process		
Proc	Regen	Other

SCREEN 57

MONDAY STOP TIME	
ON	8:00 PM

Once the Auto Stop time and day has been programmed, the Auto Stop Countdown screen (screen 34) will show the amount of time remaining before the dryer will automatically stop. The dryer can be set to automatically stop each day.

Maintenance

5
Maintenance

Preventative Maintenance Checklist

Routine maintenance will ensure optimum operation and performance of the W Series Carousel Plus Dryer. We recommend the following maintenance schedule and tasks.

- ## Whenever you change materials
  - ❐ **Drain and clean the hopper.**

- ## Weekly, or as often as needed
  - ❐ **Clean or replace the process and regeneration filters.**
    You may need to clean filters more often than weekly. Frequency depends on how much material you process and how dusty or full of fines it is.

  - ❐ **Inspect hoses and hose connections.**
    Check for damage, kinks, or loose hose clamps. Replace any hoses that show signs of damage or wear. Reposition and tighten loose hose clamps.

- ## Monthly
  - ❐ **Clean the aftercooler/intercooler and/or optional precooler coils.**
    You may need to clean the coils more often than monthly. Frequency will depend on the type and volume of material you process.

- ## Every six months
  - ❐ **Inspect gaskets for damage or wear.**
    Damaged gaskets can allow moisture to seep into the closed-loop drying system. Replace any gasket that is torn or cracked.

  - ❐ **Inspect the overhead process air duct connections.**
    (W3200-5000) Ensure that all connections are tighten properly and have no air leaks.

  - ❐ **Verify dewpoint readout and performance with calibrated portable instrument.**

  - ❐ **Measure current draw on all 3 legs of heater wires.** This is to ensure that the heater is working properly.

Checking the Dewpoint

It is a good idea to monitor the dewpoint performance of your dryer periodically with a calibrated portable dewpoint monitor, to ensure it is performing at maximum capacity. Even if your dryer has a dewpoint readout, comparing it to a portable instrument periodically will confirm that the dewpoint sensor and readout is performing properly.

To check dewpoint:

1 **Connect your portable dewpoint meter to the dewpoint check port of the dryer.**

2 **Turn on the portable instrument,** and ensure there is positive airflow through the sensor.

3 **Monitor the readout and allow ample time for it to stabilize before disconnecting the portable dewpoint monitor.** Some dewpoint monitors require a substantial amount of time for residual moisture to be purged from the sensor.

4 **In the event the dewpoint in not satisfactory,** refer to the *Troubleshooting section* of the manual, under Process Dewpoint alarm for DC2.

Alternate Procedure: (for dryers with no dewpoint check port)

1 **Stop dryer and allow it to cool.**

2 **Swing open or remove the left side panel.** *See Installation section entitled, Opening the dryer doors (W1600-5000).*

3 **Remove the 1/8 inch NPT pipe plug at the process air outlet** on the bottom manifold of the desiccant wheel assembly.

4 **Connect a portable dewpoint meter** to the hole from which the plug was just removed.

✎ **NOTE:** Portable dewpoint monitors purchased from Conair are provided with a male connector that plugs into the dewpoint check port. If you purchased your portable instrument elsewhere, the male connector is available through the Conair parts department.

✎ **NOTE:** The dewpoint check port was not included on the initial release of these dryers. It can be added easily. Contact the Conair parts department or follow the alternate procedure.

Replacement dewpoint monitors, male connectors and dewpoint check ports are available from Conair.

Contact Conair Parts
(800) 458 1960
From outside of the
United States, call:
(814) 437 6861

Checking the Dewpoint (continued)

5 **Turn on the portable instrument,** and ensure there is positive airflow through the sensor.

6 **Monitor the readout and allow ample time for it to stabilize before disconnecting the portable instrument.** Some dewpoint monitors require a substantial amount of time for residual moisture to be purged from the sensor.

7 **I**n the event the dewpoint is not satisfactory,** refer to the *Troubleshooting section* of the manual, under Process Dewpoint alarm for DC2.

8 **Stop the dryer, and allow it to cool down.** Then disconnect your portable instrument and replace any pipe plugs that may have been removed.

9 **Close or replace the side panel.**
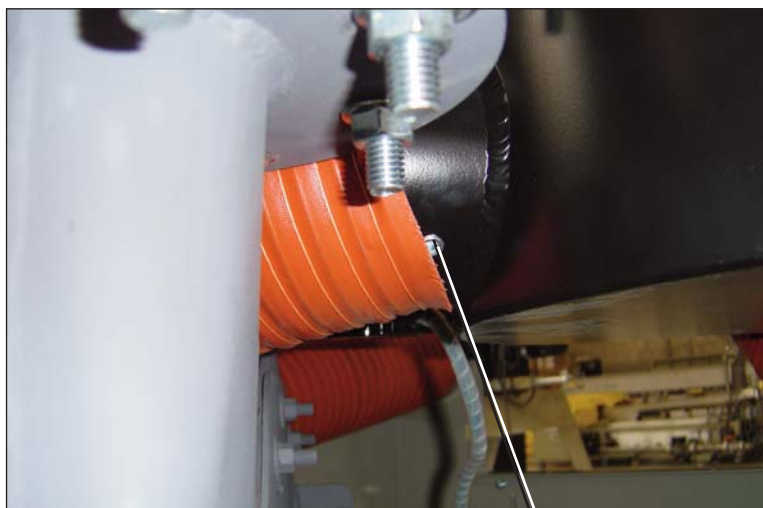
1/8 inch NPT Hole Plug

Cleaning the Hopper

⚠ **CAUTION: Hot surfaces.** Always protect yourself from hot surfaces inside and outside the dryer and drying hopper.

The hopper, spreader cone, and discharge assembly should be cleaned thoroughly between material changes to prevent resin contamination.

1   **Close the hopper slide gate.**

2   **Place a container beneath the hopper's drain port** to catch the material.

3   **Open the drain port** and allow the material to drain.

4   **Open the hopper door and wipe out the inside** of the hopper.

5   **Clean the return air screen** at the return air outlet of the hopper.

⚠ **CAUTION: Wear eye protection.** If you use compressed air to clean the equipment, **you must wear eye protection** and observe all OSHA and other safety regulations pertaining to the use of compressed air.

6   **Remove the container from beneath the hopper and replace the drain port cover** before filling the hopper with material.

Cleaning the Process Filter

Clogged filters reduce air flow and dryer efficiency. Cleaning frequency depends on how much material you process and how dusty or full of fines it is.

Carousel Plus W-series Dryers 600-1000

CAUTION: Hot surfaces. Always protect yourself from hot surfaces inside and outside the dryer and drying hopper.

1 **Push in on the sides** to release the tabs on the front cover. Remove the cover.

> ✎ **NOTE:** Larger dryer models (W1600 - 5000) do not have covers.

2 **Remove the cover wing nut,** then pull the filter cap off.

Carousel Plus W-series Dryers 1600-5000

Process Fitter Cap Latch (4)

2a **Remove the four (4) filter cap cover latches**, then pull the filter cap off.

(continued)

Cleaning the Process Filter (continued)

Carousel Plus W-series Dryers 600-5000

3 **Remove the filter wing nut,** then remove the filter.

4 **Remove outer filter** and clean it with soapy water. Let air dry.

✎ **NOTE:** On models W1600-5000 the process filter will not have an outer filter.

5 **Clean the filter by laying it on its side and gently tapping it on the floor.** Replace damaged, worn, or clogged filters.

6 **Reverse the procedure to reinstall the process filter.** Ensure that the gasket on filter cap is in place and in good condition.

⚠ **CAUTION: Wear eye protection.** If you use compressed air to clean the equipment, **you must wear eye protection** and observe all OSHA and other safety regulations pertaining to the use of compressed air.

☛ **TIP:** If gasket on the process filter cap becomes loose or detached from the filter cap, resecure with high temperature silicone adhesive.

Cleaning the Regeneration Filter

Clogged filters reduce air flow and dryer efficiency. Cleaning frequency depends on the condition of your dryer's ambient air.

1 **Push in on the sides** to release the tabs on the front cover. Remove the cover.

✎ **NOTE:** Larger dryer models (W1600 - 5000) do not have covers.

⚠ **CAUTION: Hot surfaces.** Always protect yourself from hot surfaces inside and outside the dryer and drying hopper.

2 **Remove the filter wing nut,** then remove the filter.

3 **Remove outer filter** and clean it with soapy water. Let air dry.

4 **Clean the filter by laying it on its side and gently tapping it on the floor.** Replace damaged, worn, or clogged filters.

5 **Reverse the procedure to reinstall the regeneration filter.**

⚠ **CAUTION: Wear eye protection.** If you use compressed air to clean the equipment, **you must wear eye protection** and observe all OSHA and other safety regulations pertaining to the use of compressed air.

Cleaning the Aftercooler/ Intercooler Coils

You need to clean the aftercooler/intercooler coils to keep them working efficiently. Cleaning frequency depends on the type and amount of material you process.

1 Stop the dryer and lockout the main power.

2 Turn off the water flow to the water supply line. Disconnect supply and return lines.

✎ **NOTE:** If an optional flow control was added with the aftercooler/intercooler, remove the compression fitting from the aftercooler/intercooler inlet. Loosen the fitting on the flow control, then swing the copper water supply tube out and away from the aftercooler/intercooler inlet.
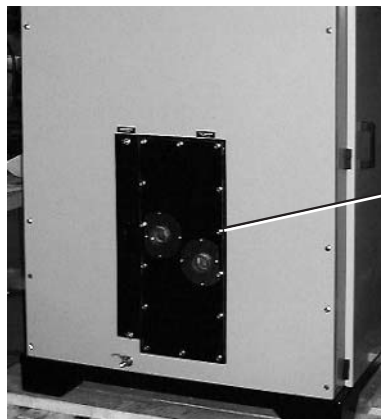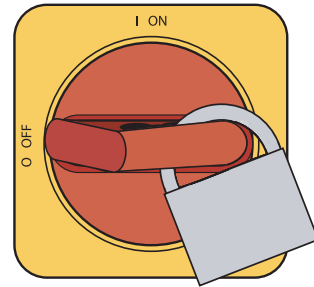
W600 - 1000 Models

W1600 - 5000 Models

3 Remove the bolts securing the aftercooler/intercooler cover. Remove the cover.

4 Remove the aftercooler/intercooler by pulling it out of the aftercooler/intercooler housing.

5
Maintenance

Cleaning the Aftercooler/
Intercooler Coils (continued)

5 **Clean the assembly using a mild soap and water.** Let the assembly
dry thoroughly before installation.

✎ **NOTE:** In cases of heavy volatiles, steam cleaning or the use of solvents, such
as acetone, may be necessary. Be sure to test a small area with the solvent
you have selected to be sure there is no adverse reaction.

6 **Inspect the condition of the gasket.** If it is damaged, replace the
gasket.

7 **Reassemble** by repeating the steps in reverse order.

8 **Connect the water supply line to the inlet.** If a manual shut off
valve is used, it should be mounted on the inlet line as well.

9 **Connect the outlet of the aftercooler/intercooler to the inlet of the
flow control valve** using the pre-shaped copper tubing and compres-
sion fittings provided.

Cleaning the Precooler Coils ⚠

You need to clean the precooler cooling coils to keep them working efficiently. See Appendix B for details.

Cleaning the Volatile Trap on the ⚠ Demister

If you have the optional volatile trap, you need to clean the trap to keep it working efficiently. See Appendix C for details.

Inspecting Hoses and Gaskets

Loose or damaged hoses and gaskets can allow moisture to seep into the closed-loop drying system.

1 **Follow the hose routing of all the hoses within the dryer and inspect all hoses, clamps, fittings, and gaskets.**

2 **Tighten any loose hose clamps or fittings.**

**3** **Replace worn or damaged hoses and gaskets.**

Troubleshooting

Before Beginning

You can avoid most problems by following the recommended installation and maintenance procedures outlined in this User Guide. If you do have a problem, this section will help you determine what caused it and how to fix it.

Before you open the side panels of the dryer be sure to:

❏ **Diagnose causes from the control panel.**

1 **Press** 🔘 **once to silence the optional audible alarm and display the alarm message.**

2 **Address the alarm message and fix the problem.** (Refer to the alarm descriptions later in this section.)

3 **Press** 🔘 **again to clear the alarm. If the alarm reappears the problem was not fixed.**

Scroll List Buttons

Acknowledge Alarm Button
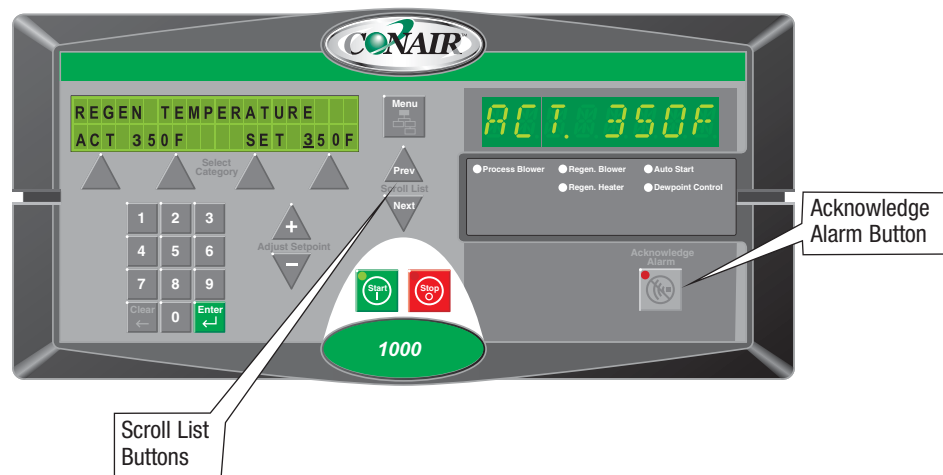
Before Beginning (continued)

❏ **Find the wiring and equipment diagrams that were shipped with your dryer.** These diagrams are the best reference for correcting a problem. The diagrams also will note any custom features, such as special wiring or alarm capabilities, not covered in this User Guide.

See warnings below. Open the electrical enclosure to check fuses and heater contactors.
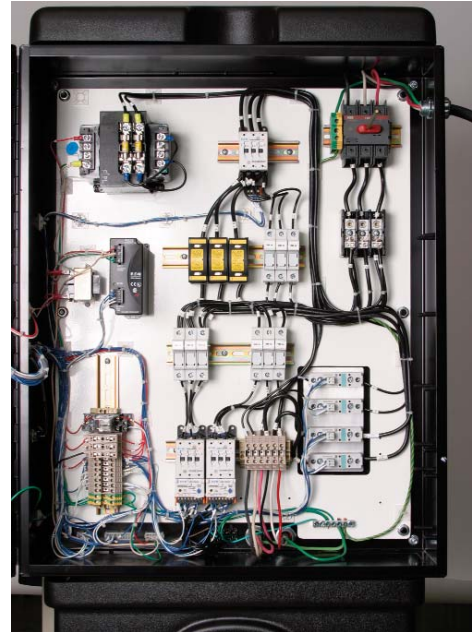
A Few Words of Caution

The Carousel Plus W Series Dryer is equipped with numerous safety devices. Do not remove or disable them. Improper corrective action can lead to hazardous conditions and should never be attempted to sustain production.

⚠ WARNING: Only qualified service personnel should examine and correct problems that require opening the dryer's electrical enclosure or using electrical wires to diagnose the cause.

⚠ WARNING: High voltage. Always stop the Carousel Plus Dryer, disconnect and lock out the main power source before troubleshooting or performing repairs.

⚠ CAUTION: Hot surfaces. Always protect yourself from hot surfaces inside and outside of the dryer and hopper.

How to Identify the Cause of a Problem

✎ **NOTE:** The dryer cannot be started if a passive alarm is present on power-up.

Dryer alarms are indicated by an illuminated Acknowledge Alarm light on the W series dryer control panel.

A problem can trigger two types of alarms:

- **Shutdown:** The dryer has automatically shut down because it has detected a serious problem that could damage your material or dryer.

- **Passive:** The dryer continues to operate, but warns of a problem that could prevent correct drying of your material. If ignored, this problem could lead to a condition that will shut down the dryer.

Acknowledge Alarm LED and Button

When the alarm light is displayed:

1 **Press the Acknowledge Alarm button once to silence the optional audible alarm and display the alarm message.** Pressing the Acknowledge Alarm button once also changes the alarm LED from blinking to solid.

2 **Find the error message in the diagnostics table** of this *Troubleshooting section*. Take any necessary steps, as directed, to resolve the problem.

3 **Note that pressing the Acknowledge Alarm button a second time will clear the alarm.** If the problem was not solved, the alarm will become active again.

There may also be a second alarm condition that occurred as a result of the first alarm.

Shutdown Alarms

If the red Acknowledge Alarm LED is blinking, the alarm is a shutdown alarm. The dryer will shutdown automatically to prevent damage to the equipment or personnel. Note that once the Acknowledge Alarm button is pressed once, the blinking red LED becomes solid.

✎ **NOTE:** Some alarms can be set for shutdown or passive (screen 59, page 4-22). These alarms may be listed in both sections.

Problem	Possible cause	Solution
Regeneration Heater High Temperature – The snap switch in the regeneration heater tube activated due to excessive temperature.	The regeneration exhaust is blocked or the air hoses are loose.	Locate and remove any airflow restrictions. Tighten any loose hoses.
	The regeneration blower is not running or running in the wrong direction.	Correct the cause of the non-running blower (fuse, etc.) or reverse the rotation of the blower.
	The isolation contactor failed in the closed position.	Replace the isolation contactor.
	The heater solid state relays (SSRs) failed.	Replace the failed heater solid state relays (SSRs).
	The regeneration heater output on the board has failed.	Replace the board.
Return Air High Temperature – If the return air temperature at the inlet to the blower is greater than 120°F {49°C}, it shuts down the dryer. (The return air temperature on W1600-5000 dryers is measured at the inlet to the desiccant wheel. *W1600-5000 dryers designed prior to August 2007,* the return air temperature is measured at the inlet to the process blower.)	The hopper does not contain enough material.	Make sure your material supply system is working properly.
	You are drying at a high drying temperature above 120°F {49°C} or you are running at low throughputs.	Ensure water flow to the aftercooler/intercooler.
	The aftercooler/intercooler does not have enough water.	Turn on the water supply, or fix any leaks or blockages.
	The aftercooler/intercooler coils are dirty.	Clean the aftercooler/intercooler coils. *See Maintenance section entitled, Cleaning the aftercooler/intercooler coils.*

Shutdown Alarms

If the red Acknowledge Alarm LED is blinking, the alarm is a shutdown alarm. The dryer will shutdown automatically to prevent damage to the equipment or personnel. Note that once the Acknowledge Alarm button is pressed once, the blinking red LED becomes solid.

✎ **NOTE:** Some alarms can be set for shutdown or passive (screen 59, page 4-22). These alarms may be listed in both sections.

Problem	Possible cause	Solution
Regeneration RTD Integrity – If the regeneration RTD is faulty, it shuts down the dryer.	There is a loose connection in the wiring leading to the RTD.	Check the RTD plug connection and make necessary repairs.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The regeneration RTD has failed.	Replace the regeneration RTD.
	The control board has failed.	Replace the control board.
Control Communications Watchdog - The display board has lost communications with the control board.	Plugs on wire harness between the display and control boards are loose or not wired correctly.	Make sure plugs are tight on board connections and match the wiring diagram.
	Display board or communications boards have failed.	Replace the defective boards.
Phase Error - One of the three power wires is connected wrong or one or more phases of power is missing.	One of the three power wires are out of phase.	Switch the position of two of the incoming lead power wires at the dryer.
	A fuse has blown.	Check and replace the fuse.
	Phase detection board has failed.	Replace the phase detection board.
EEProm Write Error	Internal control board problem.	Replace the control board.

Shutdown Alarms

If the red Acknowledge Alarm LED is blinking, the alarm is a shutdown alarm. The dryer will shutdown automatically to prevent damage to the equipment or personnel. Note that once the Acknowledge Alarm button is pressed once, the blinking red LED becomes solid.

✎ **NOTE:** Some alarms can be set for shutdown or passive (screen 59, page 4-22). These alarms may be listed in both sections.

Problem	Possible cause	Solution
Process Blower overload - If the process blower exceeds its full load amp rating or the overload has tripped due to a mechanical or electrical problem the dryer will shut down. ✎ **NOTE:** Once the overload has tripped, you must wait 2 to 15 minutes with the power on for the overload to reset automatically.	The process blower current draw has exceeded the full load amps rating of the motor.	Press alarm acknowledge and allow the overload to reset then try to restart the dryer. If the alarm condition occurs again have a qualified electrician check the current draw to the motor.
	The process blower has mechanically failed or is unable to rotate freely.	Disconnect and lock out main power. Check the process blower for mechanical failure and free rotation. Replace if necessary. Allow the overload to reset then try to restart the dryer.
	The process blower has failed electrically.	Disconnect and lock out main power. Check the process blower for electrical shorts or open circuits. Replace if necessary. Allow the overload to reset then try to restart the dryer.
	Loss of phase of power to the motor starter.	Check for a blown fuse in the dryer or main power supply. Allow the overload to reset then try to restart the dryer.
	The overload is set incorrectly.	Disconnect and lock out main power. Check the overload settings and confirm that the settings match the full load amps listed on the process blower motor. Allow the overload to reset then try to restart the dryer.
	The overload is defective.	Replace the overload.

Shutdown Alarms

If the red Acknowledge Alarm LED is blinking, the alarm is a shutdown alarm. The dryer will shutdown automatically to prevent damage to the equipment or personnel. Note that once the Acknowledge Alarm button is pressed once, the blinking red LED becomes solid.

✎ **NOTE:** Some alarms can be set for shutdown or passive (screen 59, page 4-22). These alarms may be listed in both sections.

Problem	Possible cause	Solution
Regeneration Blower overload - If the regeneration blower exceeds its full load amp rating or the overload has tripped due to a mechanical or electrical problem the dryer will shut down. The default setting for this alarm is passive but it can be changed to shutdown. ✎ **NOTE:** This alarm shuts down only the regeneration portion of the dryer. The process blower will continue to run. ✎ **NOTE:** Once the overload has tripped, you must wait 2 to 15 minutes with the power on for the overload to reset automatically.	The regeneration blower current draw has exceeded the full load amps rating of the motor.	Press alarm acknowledge and allow the overload to reset then try to restart the dryer. If the alarm condition occurs again have a qualified electrician check the current draw to the motor.
	The regeneration blower has mechanically failed or is unable to rotate freely.	Disconnect and lock out main power. Check the regeneration blower for mechanical failure and free rotation. Replace if necessary. Allow the overload to reset then try to restart the dryer.
	The regeneration blower has failed electrically.	Disconnect and lock out main power. Check the regeneration blower for electrical shorts or open circuits. Replace if necessary. Allow the overload to reset then try to restart the dryer.
	Loss of phase of power to the motor starter.	Check for a blown fuse in the dryer or main power supply. Allow the overload to reset then try to restart the dryer.
	The overload is set incorrectly.	Disconnect and lock out main power. Check the overload settings and confirm that the settings match the full load amps listed on the process blower motor. Allow the overload to reset then try to restart the dryer.
	The overload is defective.	Replace the overload.

Passive Alarms

If the amber Acknowledge Alarm LED is blinking, the alarm is a passive alarm. The dryer continues to operate, but this problem could prevent correct drying of your material. Note that once the Acknowledge Alarm button is pressed once, the blinking amber LED becomes solid.

✎ **NOTE:** Passive alarms can be configured as shutdown alarms (see the previous Shut Down Alarms section). See page 4-22, screen 59 for instructions.

Problem	Possible cause	Solution
Regeneration Temperature Deviation – The regeneration temperature exceeds the deviation band for the specified time. Default values are 10°F {6°C} for 5 seconds.	One of the solid state relays (SSRs) failed.	Replace the failed solid state relays (SSRs).
	The regeneration RTD is loose or has fallen out.	Check the regeneration RTD and tighten if needed.
	The air hose connections are loose.	Tighten all air hose connections.
	The output on the board has failed.	Replace the board.
	Defective regeneration heater.	Check the heater fuses and resistance across each leg of the regeneration heater.
Return Air Mid-High Temperature – If the return air temperature is between 150 and 180°F {66 and 82°C}. (The return air temperature on W1600-5000 dryers is measured at the inlet to the desiccant wheel. *W1600-5000 dryers designed prior to August 2007,* the return air temperature is measured at the inlet to the process blower.)	The hopper does not contain enough material.	Make sure your material supply system is working properly.
	You are drying at a high drying temperature above 120°F {49°C} or running at low throughputs.	Ensure water flow to the aftercooler/ intercooler.
	The aftercooler/intercooler does not have enough water.	Turn on the water supply, or fix any leaks or blockages.
	The aftercooler/intercooler coils are dirty.	Clean the aftercooler/intercooler coils. *See Maintenance section entitled, Cleaning the aftercooler/intercooler coils.*
Regeneration Low Temperature – The regeneration temperature is less than the low temperature setpoint for the specified time. Defaults are 200°F {93°C} for 20 seconds.	The regeneration heater has failed.	Check the heater fuses, and resistance across each leg of the process heater.
	The output on the control board has failed or the fuse has blown.	Replace the control board or the fuse.
	The regeneration RTD is loose or has fallen out.	Check the regeneration RTD and tighten if needed.

Passive Alarms

If the amber Acknowledge Alarm LED is blinking, the alarm is a passive alarm. The dryer continues to operate, but this problem could prevent correct drying of your material. Note that once the Acknowledge Alarm button is pressed once, the blinking amber LED becomes solid.

✎ **NOTE:** Passive alarms can be configured as shutdown alarms (see the previous Shut Down Alarms section). See page 4-22, screen 59 for instructions.

Problem	Possible cause	Solution
Regeneration High Temperature – If the regeneration temperature exceeds the high temperature limit for the specified time. Default values are 400°F {204°C} for 20 seconds.	One of the solid state relays (SSRs) failed in the closed position.	Replace the failed solid state relays (SSRs).
	The output on the board has failed.	Replace the board.
Regeneration Temperature Loop Break – The regeneration temperature is outside of the operator entered deviation alarm band (see Regeneration Temperature Deviation passive alarm) and the regeneration temperature is not moving towards the setpoint at a rate greater than specified. Default values are 2°F {1°C} over 40 seconds.	The regeneration heater has failed.	Check the heater fuses, and resistance across each leg of the process heater.
	The regeneration RTD is loose or has fallen out.	Check the regeneration RTD and tighten if needed.
	The regeneration blower is not running.	Check wiring or replace regeneration blower.
	The output on the control board has failed or the fuse is blown.	Replace the control board or fuse.
Process Dewpoint – The dewpoint has not fallen below the setpoint. If the dewpoint goes below the setpoint for 180 seconds the alarm should go away. ✎ **NOTE:** The alarm is not active for the first 5 minutes.	Defective dewpoint sensor.	Replace the sensor.
	The hose or wiring connections to the sensor block are loose or have fallen off.	Check wiring and hose connections to the sensor, resecure if needed.
	Poor regeneration air flow.	Remove the air flow restrictions, dirty filters, etc.
	The desiccant wheel may be contaminated.	Check the desiccant for contamination, replace if needed. Install plasticizer / volatile trap for severe situations.
		Replace the desiccant wheel. *See Troubleshooting section entitled, Replacing the desiccant wheel.*
	Desiccant wheel not turning.	*See Troubleshooting section entitled, Passive alarms, Wheel rotation alarm.*
	Leaks in the process air stream.	Check for worn or loose hoses.
	Power Purge blower not running.	Check fuses, wiring or replace blower.

Passive Alarms

If the amber Acknowledge Alarm LED is blinking, the alarm is a passive alarm. The dryer continues to operate, but this problem could prevent correct drying of your material. Note that once the Acknowledge Alarm button is pressed once, the blinking amber LED becomes solid.

✎ **NOTE:** Passive alarms can be configured as shutdown alarms (see the previous Shut Down Alarms section). See page 4-22, screen 59 for instructions.

Problem	Possible cause	Solution
Process Filter Clogged (Option) – The process filter differential pressure switch is tripped.	The process air filter is clogged.	Remove and clean or replace the process air filter.
CFM Low (Option) - The CFM calculated from the process blower differential pressure is less than the setpoint entered on the operator display.	The air hoses are loose, blocked, or kinked. The return air filter needs cleaned.	Check the process air hose for secure connections, straighten any blocked or kinked hose. Clean and/or change the return air filter.
Return Air Temperature RTD Integrity – The dryer continues to run with a passive alarm. (The return air temperature on W1600-5000 dryers is measured at the inlet to the desiccant wheel. *W1600-5000 dryers designed prior to August 2007,* the return air temperature is measured at the inlet to the process blower.)	There is a loose connection in the wiring leading to the RTD. The connection of the RTD plug on the control board is loose. The return air RTD has failed. The control board has failed.	Check the RTD plug connections and make any necessary repairs. Check the plug connection and tighten if needed. Replace the return air RTD. Replace the control board.
Wheel Rotation Failure - The regeneration temperature differential has been reached. The default differential is 20ºF / 10 seconds.	The wheel motor is not turning. The belt tensioner is loose or the belt is slipping. The regeneration heater is not working.	Check the motor, plugs, and fuses. Change the tensioner spring or replace the belt. Check the heater fuses and heater.

6 Troubleshooting

Passive Alarms

If the amber Acknowledge Alarm LED is blinking, the alarm is a passive alarm. The dryer continues to operate, but this problem could prevent correct drying of your material. Note that once the Acknowledge Alarm button is pressed once, the blinking amber LED becomes solid.

✎ **NOTE:** Passive alarms can be configured as shutdown alarms (see the previous Shut Down Alarms section). See page 4-22, screen 59 for instructions.

Problem	Possible cause	Solution
Regeneration Outlet RTD Integrity - The control can not sense the regeneration outlet RTD.	There is a loose connection in the wiring leading to the RTD.	Check the RTD plug connection and make any necessary repairs.
	The connection of the RTD plug on the control board is loose.	Check the plug connection and tighten if needed.
	The regeneration outlet RTD has failed.	Replace the regeneration outlet RTD.
	The control board has failed.	Replace the control board.
Dewpoint Deviation High - Displayed when the actual dewpoint goes above the setpoint by a specified amount of time and degrees. Defaults are set for 5°F {3°C} for 30 seconds.	Desiccant wheel not turning.	*See Troubleshooting section entitled, Passive alarms, Wheel rotation alarm.*
	The hose or wiring connections to the sensor block are loose or have fallen off.	Check wiring and hose connections to the sensor, resecure if needed.
	Poor regeneration air flow.	Remove the air flow restrictions, dirty filters, etc.
	The desiccant wheel may be contaminated.	Check the desiccant wheel for contamination, replace if needed. *See Troubleshooting section entitled, Replacing the desiccant wheel assembly.*
	Leaks in the process air stream.	Check for worn or loose hoses.
Dewpoint Deviation Low - Displayed when the actual dewpoint goes below the setpoint by a specified amount of time and degrees. Defaults are set for 5°F {3°C} for 30 seconds.	The dewpoint can not control to the desired setpoint.	Install plasticizer/volatile trap for severe situations.
		Material and/or ambient condition may be too dry to increase the actual dewpoint. Please wait several hours to determine if the setpoint can be reached. Increase the dewpoint low deviation value.
	The dewpoint sensor has failed.	Replace the dewpoint sensor.

Additional Alarms

Along with the alarm indicators, you may encounter additional messages that indicate a problem within the control.

Problem	Possible cause	Solution
Control Not Ready, Please Check Alarm - Displayed when the **"Start"** button is pushed during any active alarm. (Passive or Shutdown)	The dryer will continue to run if there is a passive alarm, however it will not start if there is a active alarm.	Push the acknowledgement button to identify the alarm, and address it as necessary.
Lost Comm w/ Ctrl Bd - Indicates there is a problem in the communication between the control board and the display board.	Loose or improperly connected wire. Improper dip switch setup on control board. Defective display or control board.	Check wiring between control board and display board. Check dip switch setup on control board. Replace boards as a set.
Error ! Incorrect Firm Version - Indicates a mismatch of software between the display board and the control board.	The software revision of the display board and control board are not compatible.	In most cases, both display and control boards will need to be replace as a set.

Additional Alarms

Along with the alarm indicators, you may encounter additional messages that indicate a problem within the control.

Problem	Possible cause	Solution
Er. Lo - There is a problem in the sensor connection (RTD, Dewpoint sensor, etc.) for the effected function.	Problem in the analog input section of the control.	Check that all jumpers are in their proper place.
		Check to see if the dewpoint sensor is connected properly.
		Disconnect the ribbon cable connecting any analog option boards to the main control board. If the display returns to normal for all values except those that are generated through the analog options boards, replace the option board.
	Defect in the main control board.	Replace main control board.
Er. Hi - There is a problem in the analog input section of the control.	RTD is not connected properly or is defective.	Check RTD connections.
		Replace defective RTD.
	The ribbon cable between an analog option board and the main control board is not connected properly.	Check connections between analog option board and the main control board.
	Connector to all RTDs is removed.	Disconnect the ribbon cable connecting any analog option boards to the main control board. If the display returns to normal for all values except those that are generated through the analog options boards, replace the option board.
	Problem in the analog input section of the control.	
	Defect in the main control board.	Replace main control board.

Dewpoint Troubleshooting

Under normal operating conditions, the dryer will produce dewpoints in the range of -40 to -20° F {-40 to -29° C}. However, you may experience situations that produce undesirable results.

Problem	Possible cause	Solution
Dryer not producing desired dewpoint.	Low regeneration air flow.	Check regeneration filter and clean and/or replace as necessary.
	Return air temperature exceeds 125°F {52°C}.	Reduce the temperature of the cooling water or increase the flow.
		Connect water to the aftercooler/intercooler if not already connected.
		Check for adequate water temperature. Water temperature should be approximately 85°F {29°C}.
	Regeneration temperature is below normal setting.	Check amperage of regeneration heaters. Replace heaters if necessary.
		⚠ **WARNING:** Any electrical checks should be performed by a qualified electrician.
	Leaks in process lines.	Check all hoses, gaskets, doors, loaders or other potential areas where leakage may occur. Replace any defective hoses or gaskets.
	Contaminated desiccant due to off-gassing, too long of a residence time or drying temperature is too high for the grade of material being processed.	Verify proper drying temperatures and residence times. If off-gassing is a condition of the material being processed, contact Conair Parts at (800) 458 1960 for the addition of a volatile trap.
	Analog option board/sensor malfunction	Verify dryer dewpoint readings with a calibrated portable dewpoint meter.
		Replace analog option board or sensor.

Poor Material Drying Troubleshooting

Occasionally, processing problems that are suspected of being caused by poor drying are eventually determined to be the result of other issues in the process setup. The intent of the information provided here is to assist you in determining if your drying system is performing properly. However, the only way to know definitely if your material is properly dried is to perform moisture analysis of small samples as it leaves the bottom of the hopper, or just as it enters the process. Conair does not sell moisture-analyzing equipment, but there are many brands of this equipment available on the market.

✎ **NOTE:** Concerns with drying temperature may require review of HTC or ResinWorks controls.

You should also be aware that some processing problems may actually be the result of over-drying material. Most materials will degrade to some extent if they are exposed to their specified drying temperature for a time significantly longer than the residence time specified by the supplier. If you want to maintain its dryness, it is recommended that you reduce the process air temperature. If your Conair dryer is equipped with the Setback feature, you should familiarize yourself with it, and make use of it. If not, you may want to contact Conair to determine if it can be added to your dryer.

A majority of customer questions to Conair are related to dewpoint. It is important to realize that dewpoint is one of **four** requirements that need to be satisfied.

There are four requirements, listed in order of importance, necessary to properly dry hygroscopic plastic resins:

1 **Drying temperature** of the air entering the hopper must be at the proper drying temperature for your material, as specified by your material supplier.

2 **Residence time** is the time, determined by your material supplier, that the material in use must be heated to achieve proper drying temperature.

3 **Airflow** during the process drying circuit must be adequate to carry and distribute the heat throughout the entire bed of material inside the hopper.

4 **Dewpoint** of the process air must be low so it can efficiently collect the moisture as it is released from the heated material and carry it to the dryer to be removed in the desiccant.

Poor Material Drying
Troubleshooting (continued)

Once it is determined which of the four requirements that is not being satisfied, refer to the following list of possible causes and solutions.

✎ **NOTE:** Concerns with drying temperature may require review of HTC or ResinWorks controls.

Temperature - The temperature of the air entering the hopper must be at the proper drying temperature for your material, as specified by your supplier.

Problem	Possible cause	Solution
The temperature of the air entering the hopper is not at proper drying temperature.	Incorrect setpoint	Refer to the drying specifications for your material and adjust the setpoint to the recommended setpoint.
		If your dryer has the Setback option, make sure it is not active unless you have specifically activated it. If necessary, refer to the Operation section of this manual for assistance in using the Setback function.
	Not able to achieve setpoint.	Replace any defective process heater, contactors, fuses, etc.
		Ensure the selected drying temperature is within the design specifications of your dryer.
	Inaccurate process temperature readout.	Ensure the Process RTD is properly positioned in the air stream.
		Determine if there is a problem in the temperature control circuit and repair or replace any defective components such as RTD, temperature control, circuit boards, etc.

Poor Material Drying
Troubleshooting (continued)

Residence Time - The time your material supplier has determined that the material in use must be heated to its drying temperature to achieve proper drying.

Problem	Possible cause	Solution
Material residence time is too long or short.	Material level in hopper is too low.	Make sure there is an adequate supply of material to feed the loader on top of the drying hopper.
		Correct any problems with the conveying system that may be preventing your loader from filling the hopper.
		If your hopper has a level sensor for maintaining a material level less than completely full, be sure this sensor is adjusted properly.
	Material throughput is too high.	Take any necessary steps, such as slowing down the process, to ensure the material usage is within design specifications of the dryer and hopper.

Poor Material Drying Troubleshooting (continued)

Airflow - The airflow in the process drying circuit must be adequate to carry and distribute the heat throughout the entire bed of material inside the hopper. If the airflow is too low, the material in the center of the hopper may get heated fully to the drying temperature, but the material against the sidewalls will not. In most cases, the material 2/3 to 3/4 of the way toward the top of the hopper should be heated to the proper drying temperature.

Problem

Too much or too little airflow.

✎ **NOTE:** If there is too much airflow, the material may fluidize inside the hopper, resulting in inconsistent material flow through the hopper, which can negatively impact residence time.

Possible cause

Dirty process air filter.

Collapsed hoses or holes/leaks in the hoses and hose connection.

Airflow restrictions.

Process blower running backwards or performing poorly.

Material level in the hopper too low.

Solution

Clean or replace the process filter.

Replace any worn or damaged hoses. Tighten all hose clamps to eliminate leaks.

Remove any obstructions in the process air circuit.

Verify the process blower is running in the correct direction. If backwards, reverse direction by switching any 2 legs of high voltage to the motor.

⚠ **WARNING:** Any electrical checks should be performed by a qualified electrician.

Repair or replace motor.

Other than running out of material to complete a job, the material level inside the hopper must be a minimum of 50% full. If the hopper is not at least half full, the material in the cone section will not get adequate airflow to dry properly.

Poor Material Drying Troubleshooting (continued)

Dewpoint - The process air must be at a low dewpoint so it can efficiently collect the moisture as it is released from the heated material and carry it to the dryer to be removed in the desiccant. In most cases, the dryer will dry your material satisfactorily if the dewpoint of the air is -20 to -40° F {-29 to -40° C}. If your dryer does not have a dewpoint readout, you can check the dewpoint with a portable dewpoint instrument. Conair sells a variety of portable dewpoint meters. Contact Conair Parts.

Problem	Possible cause	Solution
Dryer dewpoint is not reaching proper setpoint.	Low regeneration temperature.	Replace or check defective heaters, fuses etc.
	Poor regeneration airflow.	Clean or replace the regeneration filter.
		Ensure the regeneration blower is operating properly and rotating in the correct direction. *See Installation section entitled, Checking for proper airflow.*
		Remove obstructions in the air stream, such as crimped hoses, etc.
	High dewpoint, ambient air leaking into the closed loop drying circuit.	Replace damaged hoses and seal any leaks in the process air circuit.
		If using a vacuum loader on the hopper, ensure that the loader shroud is installed in the hopper and that the hopper is completely filled with material.
		If partially filling your hopper, ensure that the hopper loader is sealed against ambient air.
		Install a gasket between the loader and the top of the hopper.
	Return air temperature to the dryer is too high. (The return air temperature on W1600-5000 dryers is measured at the inlet to the desiccant wheel. *W1600-5000 dryers designed prior to August 2007,* the return air temperature is measured at the inlet to the process blower.)	Clean the aftercooler/intercooler coils. *See Maintenance section entitled, Cleaning the aftercooler/intercooler coils.*
	Poor desiccant performance.	*See Troubleshooting section entitled, Replacing the desiccant wheel assembly.*

Replacing Fuses

1 Disconnect and lockout the main power supply.

2 Open the electrical enclosure door.

3 Check the fuse with an ohmmeter. If necessary, pull the fuse out and replace it with a fuse of the same type and rating.
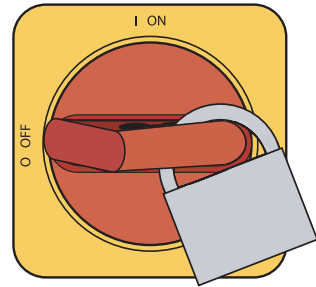
Fuse Blocks

To locate the appropriate fuse and replacement part, refer to the wiring diagrams that came with your dryer.

IMPORTANT: Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.

Checking Heater Solid State Relays

⚠ **CAUTION:** Always disconnect and lock out the main power sources before making electrical connections. Electrical connections should be made only by qualified personnel.

1 Disconnect and lockout the main power supply.

2 Open the electrical enclosure.

3 Locate the regeneration solid state relays. Refer to the wiring diagrams that came with your dryer.
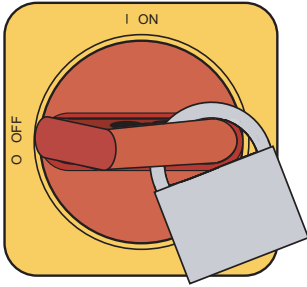
⚠

IMPORTANT: Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.
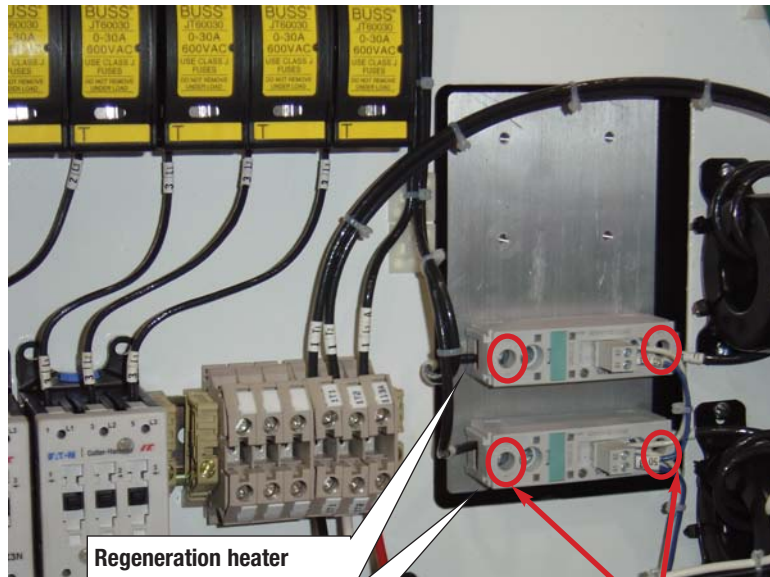
Regeneration heater solid state relays

✎ **NOTE:** Measure voltage using a voltmeter across the two high voltage connections of each relay. (Shown here circled in red.)

4 Turn power on to the machine.

5 Start the dryer.

6 Measure voltage across the high voltage connections using a voltmeter. When relay is energized, as indicated by the LED (green) voltage should be read 0 (zero). When relay is de-energized, LED off, full voltage should be measured across the relay. When relay is off, if voltage reads zero, relay is bad and needs replaced. Repeat this procedure for each relay.

Checking or Replacing Temperature Sensors

The Carousel Plus W Series Dryer uses RTD sensors to monitor the temperatures of the return air, the regeneration outlet, and the regeneration inlet.

To check or replace an RTD sensors:

1 Disconnect and lockout the main power supply.

2 Remove dryer panels, as necessary. *See Installation section entitled, Opening the dryer doors (W1600-5000).*

3 Locate the RTD sensors.

4 Check the sensor positions and conditions. Temperature readings will be incorrect, if the sensors are touching the wall of an air hose or pipe or if the sensor or wiring is damaged. The tip of the sensor should be centered within the air hose or pipe. Sensor wires should be attached to the appropriate connection points on the dryer's electrical enclosure or microprocessor board.

5 To check with ohm meter, measure the resistance across the RTDs. The resistance should be approximately 110 ohm at room temperature.

6 Replace the sensor, if necessary.

IMPORTANT: Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.
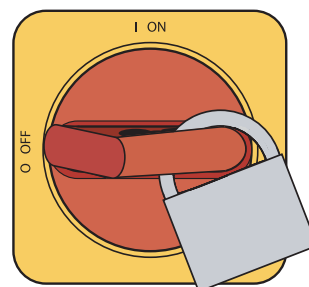
Replacing the Regeneration Heater

(W600 - 1000)

1 **Stop the dryer, disconnect the power, and follow proper lockout procedures.**

2 **Remove the right side panel of the dryer**, as viewed from the front of the dryer, to gain access to the regeneration heater.

3 **Disconnect the regeneration heater power wires from the terminal block in the control cabinet.** Feed the regeneration power cable out of the control cabinet.

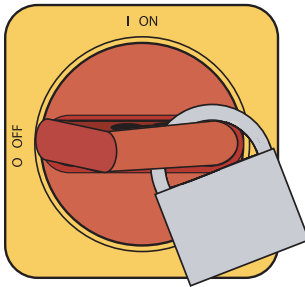**IMPORTANT:** Always refer to the wiring diagrams that came with your dryer to locate specific electrical components. Illustrations in the User Guide are intended to be representative only.

Clamp

Regeneration Heater

Clamp

Clamp

Insulation

4 **Unplug the quick disconnect for the high temperature switch cable** at the switch.

5 **Loosen the hose clamps then remove the hoses** from the top and bottom of the regeneration heater tube. Remove and check the bottom heater hose for loose debris or fragments, these fragments can damage the newly installed heater if not removed.

6 **While supporting the heater tube, loosen the hose clamp supporting the regeneration tube to the mounting bracket,** then remove the heater tube from the dryer.

7 **Slide the insulation off the heater tube,** or make a cut the entire length of the insulation sleeve to aid removal.

Replacing the Regeneration Heater

(W600 - 1000) (continued)

8 **Compare the markings on the outside of the regeneration heater tube** to ensure the new one has the same voltage and kW ratings as the original heater tube. This information is on the end nearest the wires.

9 **Slide the original insulation over the new heater** or, if the insulation was cut for removal, wrap the cut insulation sleeve around the new heater tube and secure it with duct tape.

10 **Make sure the cable end of the heater tube is to the bottom then secure the new heater tube to the mounting bracket with a hose clamp.**

11 **Connect the hoses to the top and bottom of the heater tube** and secure them with hose clamps.

12 **Connect the high temperature switch wires** to the quick disconnects near the heater tube.

13 **Route the heater power cable into the control cabinet and connect the leads to the original locations on the terminal block.** Refer to the wiring diagram for specific connection information.

14 **Replace the side panel of the dryer.**

15 **Measure the resistance from each leg of the heater tube to the others and from each leg to ground.** There should be +/- 5% resistance variation between all 3 legs, and high resistance from each leg to ground.

16 Connect the dryer to power and turn it on. **Verify that the regeneration temperature achieves the setpoint.**

Replacing the Regeneration Heater
(W1600 - 2400)
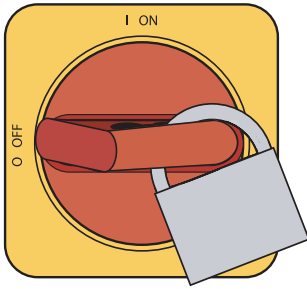
1   **Stop the dryer, disconnect and lockout the main power.**

2   **Locate the heater.** Open the side panels of the dryer locating the heater which is secured to the inlet of the desiccant wheel assembly by hard piping, brackets and clamps. *See Installation section entitled, Opening the dryer doors (W1600-5000).*

Clamp
Gasket
Clamp
Gasket
Heater Tube
Bracket
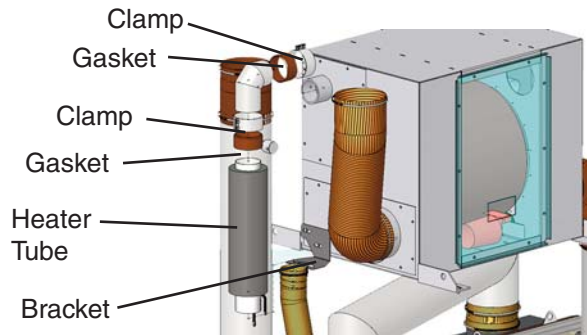
3   **Disconnect the main power leads at the junction box inside the frame of the dryer.**

4   **Disconnect the high temperature switch cable at the quick disconnect.**

5   **To remove the defective regeneration heater tube, loosen the pressure clamps at the top and bottom of the heater tube connection and slide the clamp and its silicon gasket back away from the heater tube. W1600-2400 model dryers lower clamp is attached to a bracket that is mounted to the desiccant wheel assembly, loosen clamp to remove it from the bracket.** Remove and check the bottom heater hose for loose debris or fragments, these fragments can damage the newly installed heater if not removed.

6   **Slide the insulation off the heater tube, or make a cut down the entire length of the insulation sleeve to aid removal.**

7   **Compare the markings on the outside of the regeneration heater tube to ensure the new one has the same voltage and kW ratings as the original heater tube.** This information is on the end nearest the wires.

Replacing the Regeneration Heater

(W1600 - 2400) (continued)

8 **Slide the original insulation over the new heater,** or if the insulation was cut for removal, wrap the cut insulation sleeve around the new heater tube and secure it with heat tape.

9 **Make sure the cable end of the new heater tube is to the bottom, then connect the hoses to the top and bottom of the heater tube** and resecure with pressure clamps and the lower heater tube bracket that was removed in Step 5.

10 **Connect the high temperature switch cable to the quick disconnect.**

11 **Route the heater power wires into the junction box, and connect them to the supply leads from the control box.** Refer to the wiring diagram for specific connection information.

12 **To ensure all connections are correct, measure the resistance as in Step 3.** You should measure the readings as noted for a good heater.

13 **Close the side panel of the dryer.**

14 **Connect the dryer to power and turn it on.** Verify the regeneration temperature achieves the setpoint.

Replacing the Regeneration Heater

(W3200 - 5000)
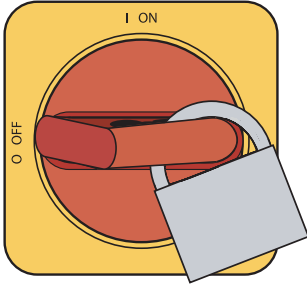
1 Stop the dryer, disconnect and lockout the main power.

2 **Locate the heater(s).** Open the side panels of the dryer locating the heaters which are secured to the inlet of the desiccant wheel assembly by hard piping, a heater tube manifold, brackets and clamps. *See Installation section entitled, Opening the dryer doors (W1600-5000).*
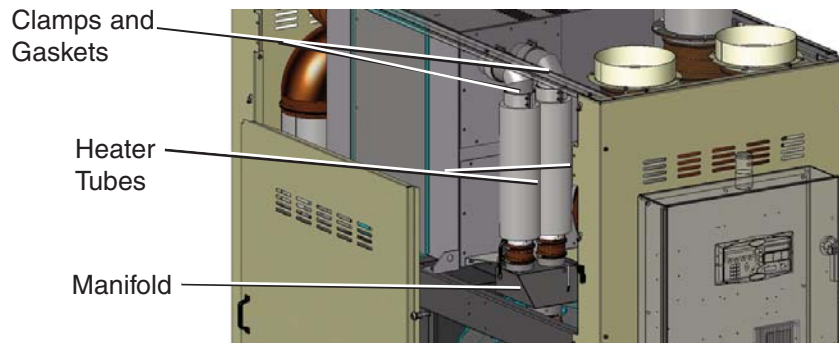
3 **Disconnect the main power leads at the junction box inside the frame of the dryer.** In units with two heaters (W3200 and W5000), it may be necessary to measure resistance across the power leads of each heater tube to determine which heater needs to be replaced. In a good element, the resistance across all three legs should be +/- 5% resistance variation when measured leg-to-leg, and high resistance from each leg to ground. Readings other than this indicate a defective heater.

4 **Disconnect the high temperature switch cables at the quick disconnects.**

5 **Loosen the pressure clamps at the top and bottom of the heater tube connection and slide the clamp and its silicon gasket back and away from the heater tube to remove the defective regeneration heater tube(s). W3200-5000 model dryers lower heater clamp(s) are attached to a manifold that is secured to the desiccant wheel assembly with a bracket, loosen the clamp that secures the heater tube to the manifold to remove it from the dryer.**
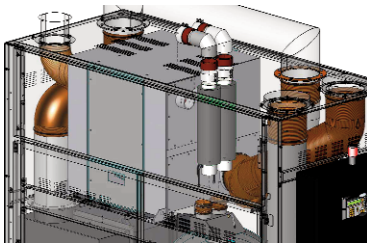
Replacing the Regeneration Heater

(W3200 - 5000) (continued)

6   **Loosen the two (2) lower clamps that secure the regeneration manifold and tubing to the desiccant wheel bracket.** Remove the regeneration manifold and the tubing that is attached to the bottom of the manifold. Then remove the tubing from the regeneration blower outlet and check for loose particles within the tubing, clean as necessary. Reverse this procedure to reinstall the regeneration manifold and tubing.

7   **Slide the insulation off the heater tube(s), or make a cut down the entire length of the insulation sleeve to aid removal.**

8   **Compare the markings on the outside of the regeneration heater tube to ensure the new one has the same voltage and kW ratings as the original heater tube.** This information is on the end nearest the wires.

9   **Slide the original insulation over the new heater,** or if the insulation was cut for removal, wrap the cut insulation sleeve around the new heater tube and secure it with heat tape.

10   **Make sure the cable end of the new heater tube is to the bottom, then reconnect the hoses to the top and bottom of the heater tube** and resecure with pressure clamps that were removed in Step 5.

11   **Connect the high temperature switch cable to the quick disconnect.**

12   **Route the heater power wires into the junction box and connect them to the supply leads from the control box.** Refer to the wiring diagram for specific connection information.

13   **To ensure all connections are correct, measure the resistance as in Step 3.** You should measure the readings as noted for a good heater.

14   **Close the side panel of the dryer.**

15   **Connect the dryer to power and turn it on.** Verify the regeneration temperature achieves the setpoint.
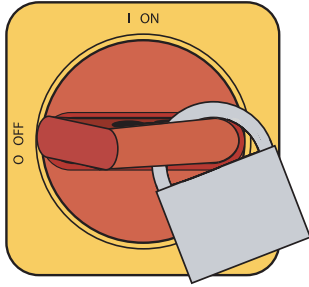
Replacing the Desiccant Wheel Assembly (W600 - 1000)

When desiccant becomes clogged or contaminated, you should replace the desiccant wheel to ensure optimum performance.

1 **Stop the dryer, disconnect the power, and follow proper lockout procedures.**

2 **Remove the upper and lower side panels from both sides of the dryer**.

3 **Remove the top cover from the dryer** by removing the securing bolts.

4 **Note the position of all the hoses, RTDs, and wiring connections then remove or disconnect** these from the desiccant wheel assembly.

5 If the dryer aftercooler is being used, **turn off the water supply to the aftercooler and disconnect the water lines** from the aftercooler.

6 **Remove the bolts securing the aftercooler assembly to the desiccant wheel assembly.**

7 **Remove the bolts securing the desiccant wheel assembly in the dryer frame.**

8 **If the dryer aftercooler is being used, slide the desiccant wheel assembly towards the front of the dryer, being careful not to let it fall off the dryer frame.** Unbolt the aftercooler assembly from the back panel of the dryer and remove it.

9 Note the orientation of the desiccant wheel assembly. **Using an overhead crane or similar device, use the lifting rings provided and lift the desiccant wheel assembly out of the dryer.**

(continued)

Replacing the Desiccant Wheel Assembly (W600 - 1000) (continued)

10 **Lift the new desiccant wheel into the dryer frame, being sure it is oriented properly.** To verify the correct orientation, ensure that the regeneration air inlet is positioned closest to the regeneration heater tube. **DO NOT** bolt into place at this time.

11 If the dryer aftercooler is being used, **slide the desiccant wheel assembly towards the front of the dryer, being careful to not let it slip off one side of the dryer frame.** Position the aftercooler assembly into the dryer frame and bolt it to the rear panel.

12 **Position the desiccant wheel assembly and bolt it in place.**

13 **Bolt the aftercooler to the desiccant wheel assembly.**

14 **If the aftercooler is being used, reconnect the water lines.**

15 **Reconnect or reinstall all hoses, RTDs, and wiring connections.**

16 **Bolt the top cover in place.**

17 **Connect the power to the dryer and start it.** Ensure that the desiccant wheel assembly rotates in the correct direction.

18 **Replace all upper and lower side panels.**

Replacing the Desiccant Wheel Motor (W600 - 1000)
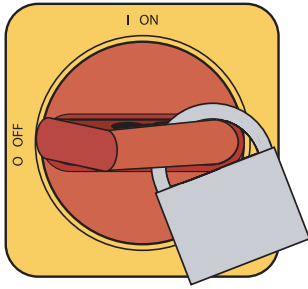
1 **Stop the dryer, disconnect and lockout the main power.**

2 **Remove both side panels.**

3 **Disconnect wiring to the motor.**

4 **Remove the pivot bolt securing the belt tensioner to the motor bracket.** Be sure to retain the flat washers located between the tensioner and bracket. Disconnect the spring and remove the tensioner.

5 **Remove the belt from the motor pulley,** then remove the pulley from the motor.

6 **Remove the screws securing the motor to the upper and lower bracket,** and remove the motor.

7 **Secure the new motor to the bracket.**

8 **Install the pulley on the new motor,** and position the belt on the pulley.

9 **Connect the spring to the tensioner, then secure the tensioner to the motor bracket.** Be sure to install flat washers between the motor bracket and the tensioner.

10 **Connect the wires to the motor.**

11 **Connect the power to the dryer.** Turn the dryer on and ensure that the desiccant wheel is rotating in the correct direction.

12 **Replace the side panels.**

Replacing the Desiccant Wheel Motor (W1600 - 5000)

1   **Stop the dryer, disconnect and lockout the main power.**

2   **Open the right side panel(s), as viewed from the front of the dryer.**
See Installation section entitled, Opening the dryer doors (W1600-5000).

3   **Unbolt and remove the access panel on the side of the desiccant wheel assembly.**

4   **Disconnect the wiring connection to the motor.**

5   **While noting the number of turns, relieve the tension on the drive bolt** by loosening the nut above the tension spring until the belt can be slipped off the motor sprocket.

6   **Unbolt the motor and remove it from its mounting bracket.**

7   **Remove the sprocket from the old motor, and install it onto the new motor.**

8   **Bolt the new motor in place.** Be sure to remove the plastic plug in the vent hole of the gearbox.
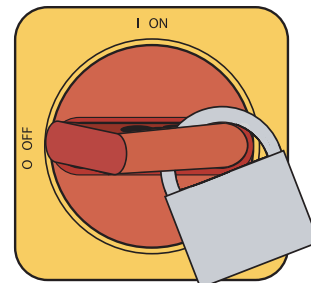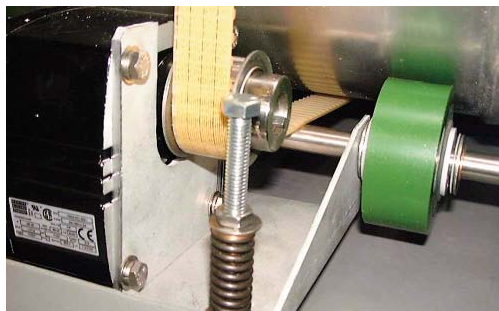
(continued)

Replacing the Desiccant Wheel
Motor (W1600 - 5000) (continued)

9 **Slip the belt onto the sprocket,** and adjust the tension spring nut to its original position.

10 **Connect the wires to the new motor.**

11 **With the access panel still removed, connect the power to the dryer and start it. Ensure the wheel turns in the correct direction.** If the belt appears to be slipping, it may be necessary to increase the tension on the drive belt slightly. Do not increase this tension any more than necessary to allow the wheel to rotate without slipping.

12 **Bolt the access panel in place** and close the side panel(s) on the dryer.

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

✎ **NOTE:** Normal operating hours are 8:00 am - 5:00 pm. After hours emergency service is available at the same phone number.

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department.

Before You Call...

If you do have a problem, please complete the following checklist before calling Conair:

❑ Make sure you have all model, control type and serial numbers from the serial tag, and parts list numbers for your particular equipment. Service personnel will need this information to assist you..

❑ Make sure power is supplied to the equipment.

❑ Make sure that all connectors and wires within and between control systems and related components have been installed correctly.

❑ Check the troubleshooting guide of this manual for a solution.

❑ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.

❑ Check that the equipment has been operated as described in this manual.

❑ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Department for a nominal fee. Most manuals can be downloading free of charge from the product section of the Conair website. www.conairgroup.com

Equipment Guarantee

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

Performance Warranty

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)

- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.

- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

Warranty Limitations

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

Cleaning the Precooler Coils

You need to clean the precooler coils to keep them working efficiently. Cleaning frequency depends on the type and amount of material you process.

1 **Stop the dryer and lockout the main power.**

2 **Turn off the water flow to the water supply line.** Disconnect supply and return lines.

✎ **NOTE:** If an optional flow control was added with the precooler, remove the compression fitting from the precooler inlet. Loosen the fitting on the flow control, then swing the copper water supply tube out and away from the precooler inlet.
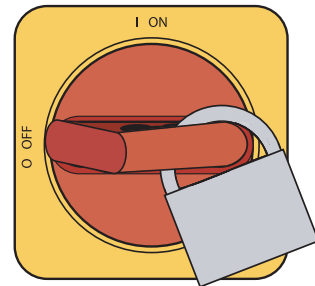
3 **Remove the bolts securing the precooler cover.** Remove the cover.

4 **Remove the precooler by pulling it out** of the precooler housing.

5 **Clean the assembly using a mild soap and water.** Let the assembly dry thoroughly before installation.

✎ **NOTE:** In cases of heavy volatiles, steam cleaning or the use of solvents, such as acetone, may be necessary. Be sure to test a small area with the solvent you have selected to be sure there is no adverse reaction.

6 **Inspect the condition of the gasket.** If it is damaged, replace the gasket.

7 **Reassemble** by repeating the steps in reverse order.

8 **Connect the water supply line to the inlet.** If a manual shut off valve is used, it should be mounted on the inlet line as well.

9 **Connect the outlet of the precooler to the inlet of the flow control valve** using the pre-shaped copper tubing and compression fittings provided.
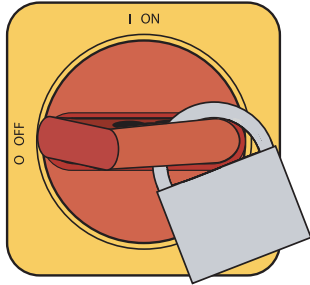
Cleaning the Volatile Trap on the Demister (W600 - 1000)

1 Stop the dryer and lockout the main power.

2 Remove the thumbscrews then remove the volatile demister cover.

3 Remove the demister by pulling it out from the housing.

4 Clean the assembly using a mild soap and water. Let the assembly dry thoroughly before installation.

✎ NOTE: In cases of heavy volatiles, steam cleaning or the use of solvents, such as acetone, may be necessary. Be sure to test a small area with the solvent you have selected to be sure there is no adverse reaction.

5 Insert the demister carefully back into the housing, making sure to completely push it towards the back of its housing.

6 Inspect the condition of the gasket. If it is damaged, replace the gasket.

7 Secure the cover in place using the original thumbscrews. Make sure the cable is not pinched between the housing and the cover.

Cleaning the Volatile Trap on the Demister (W1600 - 5000)

1 Stop the dryer and lockout the main power.

2 Remove the thumbscrews then remove the volatile demister carriage and demister from its housing.

3 Remove the demister from the demister carriage by pushing it out towards the right side of the carriage.

4 Clean the assembly using a mild soap and water. Let the assembly dry thoroughly before installation.

✎ **NOTE:** In cases of heavy volatiles, steam cleaning or the use of solvents, such as acetone, may be necessary. Be sure to test a small area with the solvent you have selected to be sure there is no adverse reaction.

5 Insert the demister carefully back into the demister carriage and then replace the entire assembly back into the demister housing.

6 Inspect the condition of the gasket. If it is damaged, replace the gasket.

7 Secure the cover in place using the original thumbscrews.
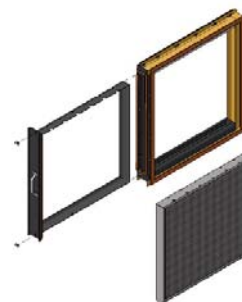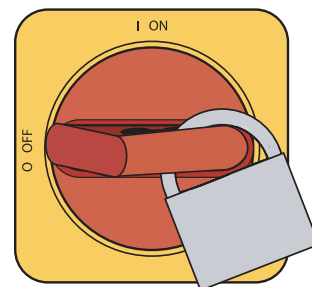
Addendum
Communication Protocols for
Common Controls

Modbus Communications, Ethernet Communications, DeviceNet Gateway Communications and SPI Communications

Table of Contents

Modbus Communications

Description of Modbus Communications

The common controls series of products from Conair use standard Modbus communications protocol to allow the user to access the control boards for supervisory type functions. For example, you may want to display the drying temperature for all hoppers in a facility in one central location. By connecting all the dryers to a central computer, the temperatures and setpoints can be displayed in one location using a standard SCADA software program such as Wonderware or RSView.

Depending on the particular common controls board, the Modbus serial communication interface maybe be either RS-232 (DC-2 control board) or RS-485 (DC control board). Converters may be ordered with the product to convert from one to the other. The RS-485 standard allows multiple controllers to be daisy-chained together over longer distances while the RS-232 allows direct connection to most personal computers without an interface adapter.

Installing the Modbus Communication Hardware

The hardware required for Modbus communications is included with the product when it is shipped. Connectors and cabling must be supplied by the user or ordered from Conair. A converter is available if your controls do not use the standard communications you desire. See Appendix A page A-3 for the proper cabling and connection information for both types of interface.

Using the Modbus Parameter List

The Modbus interface uses standard Modbus protocol to communicate with a common controls system. The data that may be retrieved is arranged in a parameter list. By using the Modbus register read and write commands, the desired data may be read from or written to the controller. The list of data that may be set or retrieved with the common controls system is arranged in Modbus registers 500 to 539. See Appendix A page A-1 for the data contained in this area for your particular type of equipment. DC-2 control parameters are used on a dryer with a DC-2 control panel and DC plus control parameters are used with Hopper Temperature Controllers (HTC) or ResinWorks.

Using the Modbus Parameter List

(continued)

⚠ **CAUTION:** The list of data that may be read and written to by the user is arranged in a specific location (parameters 500 to 540). Writing to a location with improper data, or writing to an incorrect location outside of the specified range may cause your common controls system to become inoperative or to operate in a manner that may damage your process. Be certain that you understand each parameter and its effect before changing anything. Conair recommends that you initially attempt to read from the registers and do not attempt any writes. Once the information you are trying to read has been confirmed as accurate, you can program your new/additional data.

Ethernet Communications

Description of Ethernet Communications

Modbus TCP/IP is a protocol that takes the basic Modbus command set that was originally developed for serial communications, and applies it to the Ethernet standard via TCP/IP protocol. Beginning in 2006 this protocol can be ordered as an option on the Common Control's dryers. When the option is ordered, an additional Ethernet module is soldered on to the main control board of the dryer. This Ethernet module can not be added to an existing dryer control board. Adding the option to an existing dryer will require replacing the main control board with a new board containing the Ethernet module. Depending on the revision level and display type, the display beard may need to be replaced. For easier set-up, a short length of Ethernet cable is run from the connector on the control board to an Ethernet receptacle mounted on the control enclosure. This allows you to plug into the Ethernet port without having to open the control enclosure.

Installing the Ethernet Communication Hardware

The control boards are shipped with a default Internet Protocol (IP) address of 010.001.010.254. In order for your dryer to communicate with your network, this default IP address should be changed to match the network structure used in your plant. Changing the IP address is accomplished through the DC-2 operator interface display board.

To change the IP address:

1 **Enter the supervisory level password (0210).** See your dryer manual for directions if necessary.

2 **Once the password has been entered, go to "Setup">"Other">Comm.**

3 **When the "Comm" menu is displayed, scroll down through the list until "IP Addr Part 1" is displayed.** This is the first octet (first three numbers) of the IP address. For example if the IP address is 192.168.0.100, "192" would be shown as the value in this field. If desired, change the first octet at this location.

Installing the Ethernet Communication Hardware (continued)

4 **Once you have entered the correct value, scroll down one more time until "IP Addr Part 2" is displayed.** This is the second octet (first three numbers) of the IP address and may be changed if necessary.

5 **Scrolling further down you will see additional fields for the remaining IP address octets, the subnet mask and the gateway.** Once all fields have been changed, cycling the power to the dryer will complete the process and reinitialize the Ethernet interface.

Using the Ethernet Parameter List

Please refer to page Appendix A page A-4 for a list of the parameters that are available with the Modbus TCP/IP interface.

⚠ **CAUTION:** Writing to a location with improper data, or writing to an incorrect location outside of the specified range may cause your common controls system to become inoperative or to operate in a manner that may damage your process. Be certain that you understand each parameter and its effect before changing anything. Conair recommends that you initially attempt to read from the registers and do not complete any writes. Once the information you are trying to read has been confirmed as accurate, you can now program in your new or additional data.

✎ **NOTE:** The list of parameters that may be read and written to via Modbus TCP/IP is extensive. Some of these parameters are naturally a part of the operation of the machine and others may be obscure configuration settings. The parameter list in Appendix A page A-4 includes a column with a recommendation as to whether the parameter should be accessed by a user program. Addresses that are not consecutive indicate that there are other parameters present which are not recommended for usage by the user.

DeviceNet
Communications

Description of DeviceNet Communications

The Conair Common Control board set allows you to add DeviceNet communications for information interchange with PLC systems or higher level supervisory computer systems. The DeviceNet communication is accomplished with a gateway device that converts the Modbus communications already existing on the DC-2 display board or the DC control cabinet , but may also be purchased with a DIN rail mounted enclosure. It is available with RS-232 (for the DC-2 control) or RS-485 (DC control) communications capability. These instructions assume the user is familiar with basic DeviceNet configuration and use. If not, please refer to manuals from your DeviceNet provider before attempting to use this function.

Installing the DeviceNet Communication Hardware

The DeviceNet Gateway is designed to mount to three standoffs which are attached to the door of the control cabinet below the main control board. Note that the gateway circuit board has two holes to mount the gateway and the board just rests on the third standoff to help stabilize the board. Cable 188629-04 connects between the gateway's three pin connector and the control board, connector J4. The DeviceNet drop cable is then ran to the five pin connector on the gateway.

Using the DeviceNet Communication Dip Switch Settings

The gateway has two groups of DIP switches for setup. The first set of switches (labeled S1 on the circuit board or next to the "address" label on the enclosure) is used to configure the address of the gateway on the DeviceNet network and the baud rate used by the gateway for DeviceNet communications. The second set of switches (labeled S2 on the circuit board or next the "number of controllers label) is used to set the number of controllers attached to the gateway (only for RS-485 communications), to set the baud rate used to communicate between the gateway and the dryer, and to set the number of words of data transferred from the gateway to the DeviceNet scanner (10 or 20 words of data). See next page for dip switch configuration.

Using the DeviceNet Communication Dip Switch Settings
(continued)

Dipswitch Set 1 - DeviceNet Address &
Baudrate

Dipswitch Set 2 – Temperature
Controller Enable
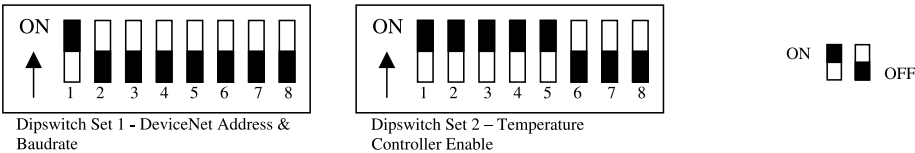
Figure I – Dipswitch Layout

Address (Decimal)	SW1 2^0	SW2 2^1	SW3 2^2	SW4 2^3	SW5 2^4	SW6 2^5
Default 01	ON	OFF	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON

Table 1 - Dipswitch Set 1 - DeviceNet Address

Baud Rate / Mode	SW7 2^6	SW8 2^7
125K	OFF	OFF
250K	ON	OFF
500K	OFF	ON
Software	ON	ON

Table 2 - Dipswitch Set 1 - DeviceNet Baud Rate

Dip switch 1 provides the DeviceNet MacId address and baud rate using the standard switch configurations found in most DeviceNet products. Switches 7 and 8 of switch set 1 allow the user to use DeviceNet software configuration tools to set the MacId address and baud rate. Factory default switch settings are 125k , Address 63.

Using the DeviceNet Communication Dip Switch Settings
(continued)

Number Controllers	SW5	SW6	SW7	SW8
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON

Table 3 - Dipswitch Set 2 - Enable Athena Controllers

Dip switch set 2 identifies the Modbus addresses of controllers connected to the DeviceNet interface. From one to eight controllers can be enable for communication through a single Athena DeviceNet interface module.

ModBus Baud Rate	SW4
19200	ON
9600	OFF

Table 4 – Dipswitch Set 2 - Modbus Baud Rate

Dip switch set 2 position 4 identifies the baud rate used to read parameters on Modbus.

Modbus Parameters	SW1	SW2
User Configurable	OFF	OFF
Parameters 500 – 519	OFF	ON
Parameters 500 - 509	ON	OFF
User Configurable	ON	ON

Table 5 – Dipswitch Set 2 - Modbus Parameter List

Dip switch set 2 positions 1-2 identify the parameter list for the Conair controllers.

Using the LED Status Indicators

There are two LEDs on the gateway which display the status of the communications. The first LED, which is located between the dip switches (labeled "Controllers" on the gateways with the enclosure), display the status of the Modbus communications between the gateway and the control circuit board. The second LED (labeled "DeviceNet" on the gateways with the enclosure) display the status of the DeviceNet communications.

1. Controller Status LED (between dip switches)

Color	State	Indication
None	Off	No power
Red	Solid	No controllers online
Red	Flashing	"Illegal Date" error
Green	Solid	Normal operation - All controllers online
Green	Flashing	One or more controllers offline or not present

2. DeviceNet Status LED

Color	State	Indication
None	Off	No power
Red	Solid	Unrecoverable DeviceNet fault
Red	Flashing	Output error or configuration error
Green	Solid	Normal operation
Green	Flashing	Device is in idle mode or not allocated to a master

Configuring the DeviceNet Software
Installing the EDS Files

There are multiple EDS (electronic date sheet) files associated with the gateway depending on how many controllers are attached to a gateway. The files are named based on the number of controllers (i.e. an EDS file for a gateway with three controllers attached is named 3Conair.EDS). Choose the appropriate file for your application and install it using your DeviceNet network's EDS installer options. Once the EDS files are installed they will be shown under the "Conair Common Control" heading in the EDS file manager. If you install more than one of the EDS files the files will all be named "Conair Common Control" with the hexadecimal designator to differentiate the different files. By opening the devices parameter list you can tell how many controllers are associated with the EDS file.

Configuring the DeviceNet Software
Installing the EDS Files (continued)
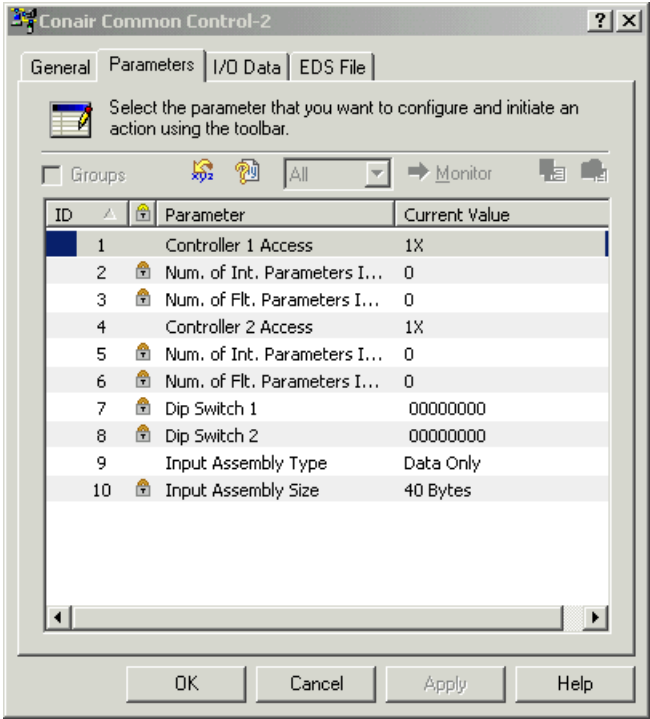
Configuring the DeviceNet Software
EDS File Parameter List Configuration Options

Once the EDS file has been installed the gateway may be added to a network configuration. There are a number of parameters that may be configured for each gateway to optimize it for your application. The number of parameters will vary depending on how many controllers are attached to a gateway.

Configuring the DeviceNet Software
EDS File Parameter List Configuration
Options (continued)

There are seven types of parameters:

Parameter 1   Controller Access   1X, 10X, 100X

This parameter controls, the format of the data that is retrieved from the controller. If 1X is chosen the data will be retrieved as a whole number with no implied decimal place. For example, if a process temperature was retrieved and the real value of the temperature was 225.3927, the temperature would be read as 225 using the 1X register format. If 10X was chosen the raw data would be retrieved as 2253, requiring the user to add the implied decimal point to show the temperature as 225.3. Similarly, if the data was retrieved in the 100X format the raw data would be 22539 requiring the user to add the decimal place to display it as 225.39.

Parameter 2   Number of Int. Parameters   0 to 40

This field will display how many integer parameters are retrieved from the controller. This will be either 10 or 20 depending on the position of dip switch 2, switches 1 and 2.

Parameter 3   Number of Flt Parameters   0 to 10

This field will display how many floating point parameters are retrieved from the controller. The default is zero and is not normally changed by the user. If your application requires the use of floating point numbers, please consult with a Conair representative.

Parameter 4   Dip switch 1   Combination of 1's and 0's

This field shows the actual positions of dip switch 1 on the gateway.

Parameter 5   Dip switch 2   Combination of 1's and 0's

This field shows the actual positions of dip switch 2 on the gateway.

Configuring the DeviceNet Software
EDS File Parameter List Configuration
Options (continued)

Parameter 6   Input Assembly Type   Status only, Status w/data, Data only

This field will choose whether the data retrieved consists of only the process data from the controller (data only), the status bytes from the gateway (status only), or the data and the status bytes (status w/data).

✎ **NOTE:** When this field is modified the change must be applied. The size of the data block being retrieved (see parameter 7) will change based on the configuration of this parameter.

Parameter 7   Input Assembly Size   0 to 160

This field will display the actual size of the input data that is being retrieved from the gateway to the master on the DeviceNet network. See the section on adding the gateway to the scan list for further information on the parameter.

Configuring the DeviceNet Software
Adding the Gateway to the Scan List

Adding the gateway to a scan list requires that the data area is sized correctly and mapped to the correct locations.

To add the gateway to the scan list:

1 Set all dip switches as described in the *"DeviceNet communications section, entitled Using the DeviceNet communication dip switch settings"*.

2 Go online with the device on the network and set the parameters described in the *"DeviceNet communications section, entitled Configuring the DeviceNet software, EDS File Parameter List Configuration Options"*.

3 Once the parameters are set, download the parameters to the gateway using the "Apply" button.

Configuring the DeviceNet Software
Adding the Gateway to the Scan List
(continued)

4 **Close the parameter list and reopen,** once you have applied your parameters. Check Parameter 7 to see how many bytes of data are in the input assembly size.

5 **Go online with the scanner and move the gateway from the "Available Devices" area to the "Scanlist"** area using the arrow key. After the gateway has been moved, the "Edit I/O Parameters" button should be accessible.
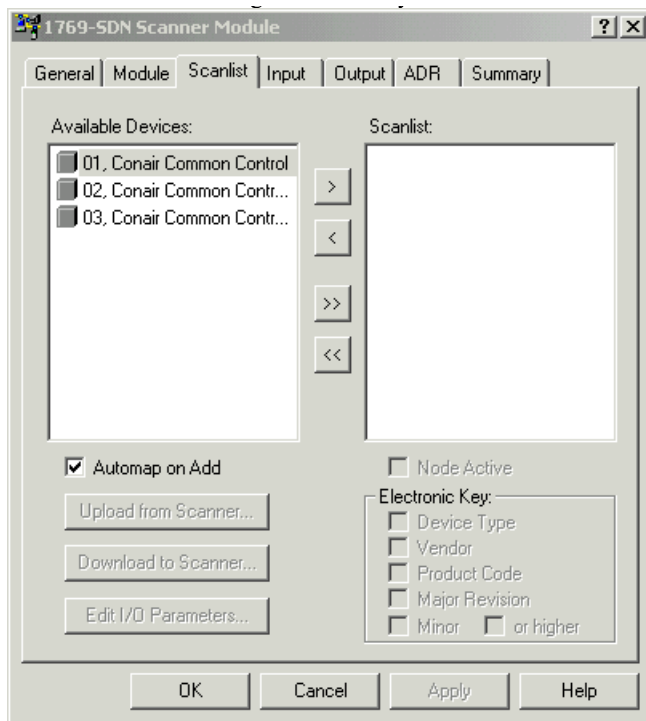
Configuring the DeviceNet Software
Adding the Gateway to the Scan List
(continued)
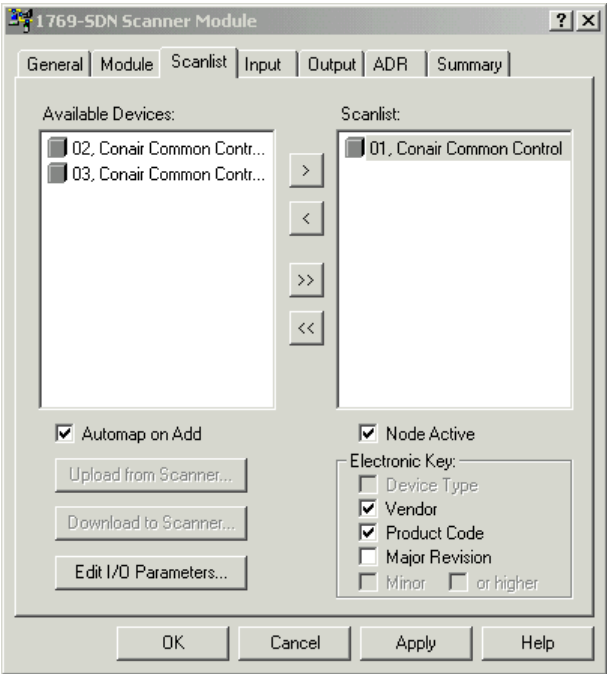
Press the "Edit I/O Parameter" button to to the configure the I/O parameters.
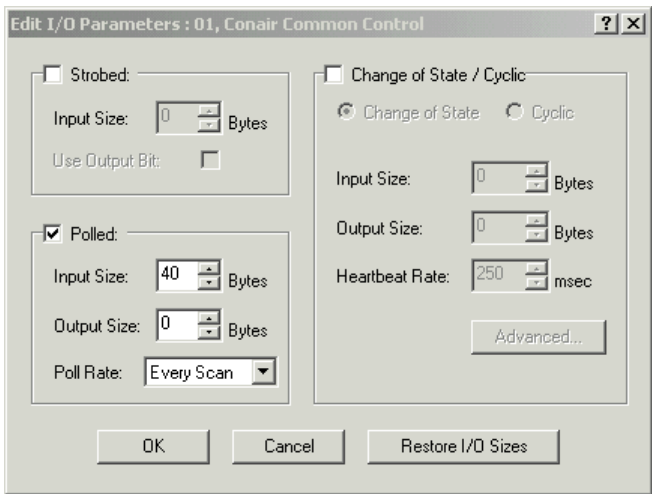
(continued)

Configuring the DeviceNet Software
Adding the Gateway to the Scan List
(continued)

6 **Select the "OK" button once you have modified your input field size to match the number of bytes shown in Parameter 7.** Since the actual data size being used differs from the maximum possible data size, you will get an error message noting this. Click the "OK" button to keep the data size you have entered.

7 **Once the I/O parameters have been modified, the gateway may be mapped to your desired I/O area using the Input tab.** Depending on whether your controller is 16 bit (Allen Bradley Micrologix) or 32 bit (Allen Bradley Controllogix) the data may transfer either as individual words (16 bit) or two parameter words may be combined into a DINT (32 bit). All parameters should now be accessible from the programmable logic controller. (PLC)

Configuring the DeviceNet Software
Explicitly Writing to the Gateway

As discussed above, the information from the Common Controls Systems can be set up to be read directly as inputs in a PLC system. In order to write data to the gateway it must be written in a DeviceNet Explicit message. The method was chosen to ensure that data is written once, only when the PLC decides it should be written. This reduces bandwidth on the network and ensures that the data is sent only when it is required. Note that parameters 530 to 539 are set up as the registers to write to the common controls devices. Please see your DeviceNet system provider's information on using explicit messaging for more details.

Configuring the DeviceNet Software
Gateway Parameter List

Similarly to the Modbus communications, the Common Controls parameters that are available are stored in registers 500 to 539. The dip switches determine how much of the list is transferred to the PLC. If the dip switch is set for ten words, Modbus parameters 500 to 509 will be transferred to the input image of the scanner. If the dip switches are set for twenty words, Modbus parameters 500 to 519 will be transferred to the scanner. See Appendix A page A-1 for the actual parameters that are available from the type of common control device that your system is using.

SPI Communications

D
SPI

Description of SPI Communications

The Society of Plastics Industry (SPI) has defined a standard protocol to be used for interconnecting plastics equipment. This protocol uses the RS-485 standard as the physical connection and defines stand addresses and commands to communicate with the various kinds of equipment in common use at a typical plastics facility. For example, a dryer is specified as Device ID 22 hex, a chiller is Device ID 21 hex. The data retrieved for each type of equipment is defined in the standard. For a dryer or other piece of equipment to be in compliance with the SPI standard you must be able to retrieve certain parameters such as the setpoint process temperature, high and low temperature deviation alarms, temperature to the process, temperature to the process, etc. Some parameters are also designated as optional parameters that may or may not be available depending on the equipment provider's discretion.

Installing the SPI Communication Hardware

The SPI option is available with the DC-2 display boards. The display boards have a RS-232 port built into the board. The RS-232 to RS-485 converters are provided and mount on the inside of the door of the electrical cabinet. The RS-485 SPI signal is then brought to the outside of the cabinet by a 9 pin D-sub connector. Refer to Conair drawing 130024 and 188629 in Appendix A page A-3 for details of the installation. The RS-485 SPI signal is available on pins 4 and 5 of the DB-9 connector. Pins 8 and 9 also have the RS-485 connection (parallel with pins 4 and 5) to assist in daisy-chaining equipment together.

Configuring the SPI Communication Software

The SPI protocol option must be turned on and configured in the operator display before it may be used.

To setup the SPI communications:

1 **Enter the supervisory level password (0210).** See your dryer manual for directions if necessary.

(continued)

Configuring the SPI Communication Software (continued)

2 Once the password has been entered, go to "Setup">"Other">Comm.

3 When the "Comm" menu is displayed, scroll down through the menu and set the "Protocol" to"SPI". Set the slave ID to a unique address on the RS-485 network master. Once you have completed entering in your information, return to the opening menu and cycle the power on your equipment to establish the new settings.

In order to connect Conair equipment to a host computer system, Conair can provide an SPI-DDE server which will allow DDE compliant software packages such as Wonderware or Excel to connect to the SPI network with minimal programming required.

For more information on the SPI protocol, you can obtain the SPI Communication protocol manual by contacting:

The Society of Plastics Industry, Inc.
1801 K Street, NW, Suite 600K
Washington, D.C. 20006
(202) 974-5200 Fax (202) 296-7005
www.plasticsindustry.com

D
SPI

Supported Dryer SPI Commands

SPI protocol defines two different modes, "Select" and "Poll". "Select" commands are used to set or change the information in the dryer. For example, to change a temperature setpoint from 200°F to 250°F {93°C to 121°C} a "Select" command is used. "Poll" commands are used to read the information without changing or modifying it. For example, when you simply want to display the actual process temperature. In either case two hex command bytes are sent to the equipment to specify what communication action to take.

The following list shows the "Select" and "Poll" bytes along with a description of the information that may be retrieved from Conair dryers.

1. **Echo** - Allows the master to test a piece of equipment by writing 4 bytes of information to the equipment and then reading it back.

>   Select: 20h, 21h   Poll: 20h, 20h

2. **Version** - Read the SPI version from the equipment.

>   Select: NA   Poll: 20h, 22h

3. **Setpoint Process Temperature** - Sets and retrieves the process temperature setpoint.

>   Select: 20h, 31h   Poll: 20h, 30h

4. **Alarm, High Temperature Deviation** - Sets and retrieves the high temperature deviation alarm setpoint. Not that in Conair dryers there is actually only deviation setpoint that is used for both high and low temperature deviation. The last value written to either the high or the low will be the value that is used.

>   Select: 20h, 33h   Poll: 20h, 34h

5. **Alarm, Low Temperature Deviation** - Sets and retrieves the low temperature deviation alarm setpoint. Not that in Conair dryers there is actually only deviation setpoint that is used for both high and low temperature deviation. The last value written to either the high or the low will be the value that is used.

>   Select: 20h, 35h   Poll: 20h, 34h   (continued)

Supported Dryer SPI Commands

(continued)

6. **Status, Process** - Indicates that the status of the process with each "bit" showing a particular condition.

The "bits" are defined as follows:

Bit 0 - Processing (dryer running)

Bit1 - Alarm, System (any alarm that indicates a problem that may affect the drying operation)

Bit3 - Alarm, Machine (any alarm that indicates a problem with the dryer itself)

Bit4 - Alarm, High Temperature Deviation

Bit5 - Alarm, Low Temperature Deviation

Bit6 - Reserved

Bit7 - Reserved

Bit8 - Alarm, Filter clogged

Bit9 - Alarm, Low flow

Bit10 - Alarm, High Dewpoint

Bit11- Reserved

Bit12 - Reserved

Bit13 - Reserved

Bit14 - Temperature out of band deviation

Bit15 - Not used

<div style="text-align:center">Select: NA   Poll: 20h, 40h</div>

Supported Dryer SPI Commands

(continued)

7. **Status, Machine 1** - Indicates that the status of the dryer itself with each "bit" showing a particular condition.

The "bits" are defined as follows:

Bit0 - Processing (dryer running)

Bit1 - Alarm, System (any alarm that indicates a problem that may affect the

   drying operation)

Bit2 - Alarm, Process (any alarm that indicates a problem with the process itself)

Bit3 - Alarm, Machine (any alarm that indicates a problem with the dryer itself)

Bit4 - Alarm, High Temperature (any temperature input)

Bit5 - Alarm, Low Temperature (any temperature input)

Bit6 - Reserved

Bit7 - Reserved

Bit8 - Reserved

Bit9 - Alarm, Low flow

Bit10 - Alarm, High voltage (not supported)

Bit11 - Alarm, Low voltage (not supported)

Bit12 - Alarm, High current (not supported)

Bit13 - Alarm, Low current (not supported)

Bit14 - Alarm, Phase

Bit15- Not used

Select: NA   Poll: 20h, 42h

Supported Dryer SPI Commands

(continued)

8. **Status, Machine 2** - This word shows the status of the Dryer itself with each bit showing a particular condition.

The "bits" are defined as follows:

Bit0 - Processing (dryer running)

Bit1 - Alarm, System (any alarm that indicates a problem that may affect the

    drying operation)

Bit2 - Alarm, Process (any alarm that indicates a problem with the process itself)

Bit3 - Alarm, Machine (any alarm that indicates a problem with the dryer itself)

Bit4 - Fault Sensor

Bit5 - Fault, Calibration

Bit6 - Reserved

Bit7 - Reserved

Bit8 - Reserved

Bit9 - Reserved

Bit10 - Reserved

Bit11 - Reserved

Bit12 - Reserved

Bit13 - Reserved

Bit14 - Reserved

Bit15- Reserved

Select: NA   Poll: 20h, 44h

(continued)

Supported Dryer SPI Commands
(continued)

9. **Mode, Machine** - This is used to start/stop the dryer, acknowledge alarms and observe the run status.

Bit0 -Start/Stop (1 = running or start, 0 = stop or stopped)
Bit1 - Acknowledge Alarms

        Select: 20h, 49h   Poll: 20h, 48h

10. **Temperature, To Process** - This is the actual the actual process (drying) temperature controlled by the dryer.

        Select: NA   Poll: 20h, 70h

11. **Temperature, From Process** - This is the actual temperature as read by the RTD at the exit of the drying hopper. This is the temperature that is used for setback control in the dryer. Note that this is an optional feature and the value may be invalid if the feature is not installed on the dryer.

        Select: NA   Poll: 20h, 72h

12. **Flow, To Process** - This is the flow of dry air to the process. Note that this is an optional feature and the value may be invalid if the feature is not installed on the dryer.

        Select: NA   Poll: 20h, 78h

13. **Dewpoint** - This is the actual dewpoint of the process air. Note that this is an optional feature and the value may be invalid if the feature is not installed on the dryer.

        Select: NA   Poll: 20h, 7Ch

14. **Setpoint, High Dewpoint Alarm** - This is the setpoint for the dewpoint alarm triggered by 13.

        Select: 20h, 81h   Poll: 20h, 80h

Modbus RS-232/485 Serial Communication Parameters

DC-2 Control Parameters - Used on dryers with DC-2 Controls

Read Area

Modbus Register Number	Description	Comments
500	Product Type	
501	Process Temperature Setpoint	
502	Process Actual Temperature	
503	Process Temperature Setpoint (Setback)	
504	Return Air Temperature Out of Hopper	
505	Return Air Setpoint (Setback)	
506	Regeneration Actual Temperature	
507	Dewpoint Actual	
508	Operational Mode	
509	Running Status	
510	Return Air Actual	
511	Shutdown Alarms	
512	Passive Alarms	
513	Load Rate Setpoint (Setback)	
514	Average Load Rate Actual (Setback)	
515	Process Heater Output Actual %	
516	Regeneration Heater Output Actual %	
517	Process Protect Actual Temperature	
518	Product Type	
519	Product Type	

Write Area

Modbus Register Number	Description	Comments
530	Process Temperature Setpoint	
531	Process Temperature Setpoint (Setback)	
532	Return Air Setpoint (Setback)	
533	Load Rate Setpoint (Setback)	
534	PM 1 Dewpoint Setpoint	(continued)

Modbus RS-232/485 Serial Communication Parameters (continued)

Modbus Register Number	Description	Comments
535	Start Command	1 = start
536	Stop Command	1 = stop
537	Alarm Acknowledge	
538	Process Temperature Setpoint	
539	Process Temperature Setpoint	

DC Plus Control Parameters - Used on ResinWorks and Hopper Temperature Controllers (HTC)

Modbus Register Number	Description	Comments
500	Product Type	
501	Process Temperature Setpoint	
502	Process Actual Temperature	
503	Process Temperature Setpoint (Setback)	
504	Return Air Temperature Out of Hopper	
505	Return Air Setpoint (Setback)	
506	Load Rate Setpoint (Setback)	
507	Average Load Rate Actual (Setback)	
508	Operational Mode	
509	Running Status	
510	Process Heater Output Actual %	
511	Alarms	
512	RTD Integrity Alarms	
513	Regeneration Actual Temperature	
514	Regeneration Heater Output Actual %	
515	Process Protect Actual Temperature	
516	Product Type	
517	Product Type	
518	Product Type	
519	Product Type	

(continued)

Modbus RS-232/485 Serial Communication Parameters (continued)

DC Plus Control Parameters - Used on ResinWorks and Hopper Temperature Controllers (HTC)

Modbus Register Number	Description	Comments
530	Process Temperature Setpoint	
531	Process Temperature Setpoint (Setback)	
532	Return Air Setpoint (Setback)	
533	Load Rate Setpoint (Setback)	
534	PM 1 Dewpoint Setpoint	
535	Start Command	1 = start
536	Stop Command	1 = stop
537	Alarm Acknowledge	
538	Process Temperature Setpoint	
539	Process Temperature Setpoint	

Related Drawings

130023 - Common Controls DeviceNet Gateway Assemblies, D dryers

130023-02 - CDDS DeviceNet Gateway Assembly

130023-03 - Common Controls DeviceNet Gateway Assemblies, W dryers

13024 - Common Controls SPI Communications Assembly

188629 - Common Controls 24 VAC Power and Comms Cables

18865201 - W15-100 Dryer SPI Control Communications Assembly

18865202 - WMDC15-100 Dryer SPI Control Communications Assembly

18865203 - W150-5000 Dryer SPI Control Communications Assembly

18865204 - W15-100 Dryer Modbus Control Communications Assembly

18865205 - WMDC15-100 Dryer Modbus Control Communications Assembly

18865206 - W150-500 Dryer Modbus Control Communications Assembly

18865207 - W15-100 Dryer DeviceNet Control Communications Assembly

18865208 - WMDC15-100 Dryer DeviceNet Control Communications Assembly

18865209 - W150-5000 Dryer DeviceNet Control Communications Assembly

18865210 - W Dryer Ethernet Control Communications Assembly

Modbus TCP/IP
Communications Parameters

Legends:
F   Floating Point Parameter
I   Integer Parameter
RO Read Only
WO Write Only

Conair Dryer Enhanced Main Control Board   Rev.01

Modbus Address	Type	Description	Default	Range	Recommended for Customer Reads	Recommended for Customer Writes	Comments
40001	I	Dryer Type	1	0 Central Dryer (No process heater) 1 Standard Dryer 2 Unused 3 1-Hopper MDC 4 2-Hopper MDC	Y	N	
40002	I, RO	Control Board Software Version	1	xyyzz base 5 digits x = 1, Small Electric Dryer = 2, Wheel Electric Dryer yy Major release zz Minor release	Y	N	
40016	I	Drying Monitor High Alarm Delay	1	0 - 30 Min.	Y	Y	
40017	I	Stop Conveying if Shutdown Alarm Active	1	0 – No 1 – Yes	Y	Y	
40018	I	Delay Time for Stopping Conveying	60	0 – 240 Min.	Y	Y	
40020	I	Self Loading Option (Wheel)	0	0 – Machine Loader Only 1 – Machine Loader + Hopper Loader 2 – Ratio Valve + Option1	Y	N	
40021	I	Hopper Loader Virgin Load Time(Wheel)	5	1 – 60 Sec.	Y	Y	
40022	I	Hopper Loader Regrind Load Time (Wheel)	5	1 – 60 Sec.	Y	Y	
40023	I	Hopper Loader Load Time (Wheel)	5	1 – 60 Sec.	Y	Y	
40024	I	Layering On/Off (Wheel)	0	0 – Off 1 – On	Y	Y	
40041	I, RO	Operating Mode	1	0 Power Up 1 Standby 2 Starting 3 Stopping 4 Autotuning 5 Calibrating 6 Running 7 Indexing 8 Index End 9 Index Reset 10 Test Mode	Y	N	
40042	I, RO	Running Status	0	Bit values. MSB=7. LSB=0. This returns the actual running status. Bit value: No = 0 Yes = 1 ======================== 0 Ready To Run 1 Hop1 Setback Active 2 60 Sec. Prior to Index 3 PM1 Active 4 Alarm Silenced 5 Shutdown Alarm Active 6 Passive Alarm Active 7 Hop2 Setback Active 8 Booster2 is Ramping 9 Process is Ramping 10 Regen is Ramping 11 Dewpoint Control Active 12 Pre-Cooler Active	Y	N	

Register	Type	Name	Description	Default			Notes
40043	I, RO	Shutdown Alarm Status	Bit values. MSB=15. LSB=0. This returns the actual shutdown alarm status. Bit value: Inactive = 0, Active = 1 =================== 0 Process High Temperature 1 Process Temperature Loop Break 2 Process Heater Box High Temperature 3 Process Protection High Alarm 4 Process Differential Alarm 5 Regen Heater Box High Temperature 6 Carousel Index Too Long 7 Carousel Index Failure 8 Return Air High Temerature 9 Unused 10 Unused 11 Watchdog Timeout 12 Booster2 Heater Box High Temperature 13 Phase Error 14 EEprom Write Error 15 Process Blower Overload	0	Y	N	
40044	I, RO	Passive Alarm Status	Bit values. MSB=15. LSB=0. This returns the actual passive alarm status. Bit value: Inactive = 0, Active = 1 =================== 0 Process Temperature Deviation 1 Process Low Temperature 2 Regen Temperature Deviation 3 Regen Low Temperature 4 Regen High Temperature 5 Regen Temperature Loop Break 6 Return Air Mid-High Temperature 7 After-Cooler Loop Break 8 Process Dewpoint (PM1) 9 Process Filter Clogged 10 CFM low 11 CFM high 12 Drying Monitor Low Temperature 13 Drying Monitor Temperature not Met 14 Conveying Alarm 15 MDC Conveying Blower Overload	0	Y	N	
40045	I, RO	Temp Input Integrity Status	Bit values. MSB=7. LSB=0. This returns the actual RTD integrity status. Bit value: Good = 0, Bad = 1 =================== 0 Booster2 Probe 1 Process Probe 2 Regen Temperature Probe 3 Out of Hopper2 Probe 4 Return Air Temperature Probe 5 Process Protection Probe 6 Out of Hopper Probe 7 Regen Out of Wheel Probe	0	Y	N	
40101	-	Process Heater Output %	0 to 100%	0	Y	N	
40111	-	Process with Pre-Cooler Output %	0 to 100%	0	Y	N	
40139	-	After-Cooler Output %	0 to 100%	0	Y	N	
40154	-	Regen Heater Output %	0 to 100%	0	Y	N	
40163	-	DM Alarm Inhibit Time	0 - 1000 min.	20	Y	N	
40164	-	DM Alarm Delay Time	0 - 1000 sec.	20	Y	N	
40189	-	DM2 Alarm Selection	0 – OFF 1 – T3 2 – T4 3 – T5 4 – T6	0	Y	Y	One probe must be selected for Drying Monitor operation.
40193	-	DM2 Alarm Delay	0 - 30 minutes	5	Y	Y	
40194	-	DM2 Temperature not Met Time	1 - 24 Hours	4	Y	Y	

Register	Type	Description	Default	Detail			Notes
40229		Blower Type	0	The following are for Carousel Dryers 0 — D15 1 — D25 2 — D50 3 — D75 4 — D100 The following are for Wheel Dryers 0 — W15 1 — W25 2 — W50 3 — W75 4 — W100 5 — W150 6 — W200 7 — W300 8 — W400 9 — W600 10 — W800 11 — W1000 12 — W1600 13 — W2400 14 — W3200 15 — W5000			
40238	I	Machine Loader Load Time (Hop1)	5 s	1 - 60 Seconds	Y	N	
40239	I	Conveyor Off Time	5 s	1 - 60 Seconds	Y	Y	
40241	I	Dewpoint Alarm Time Delay	180 s	0 - 1000 seconds	Y	N	
40242	I	Options	0	Bit values. MSB=15, LSB=0. Every bit represents an option, Bit value: Not Installed = 0 Installed = 1. ===================================== 0 Filter Check Monitor (B) 1 Power Miser 1 (M) (Carousel) Dewpoint Control (Wheel) 2 Power Miser 2 (I) (E) 3 Setback on Temperature 4 Pre-cooler (G) 5 After-cooler (H) 6 Drying Monitor (F) 7 Process Heater Current (K) 8 Regen Heater Current (L) 9 CPM Monitor (N) 10 Unused 11 Unused 12 Phase Detector 13 Setback on Load Rate 14 Dewpoint Monitor 15 Pre-Cooler Flow Control	Y	N	
40247	I	Conveying On Time (Hop2)	10 s	5 - 20 Seconds	Y	Y	
40256	I, RO	Passive Alarm2		Bit values. MSB=15. LSB=0. This returns the actual passive alarm status. Bit value: Inactive = 0 Active = 1 ===================================== 0 Booster2 Loopbreak 1 Booster2 High Temperature 2 Booster2 Temperature Deviation 3 Booster2 Low Temperature 4 Regen Blower Overload 5 Wheel Rotation Fail 6 Dewpoint High Deviation Alarm 7 Dewpoint Low Deviation Alarm 8 Machine Load Alarm 9 Hopper Load Alarm 10 Drying Monitor High Alarm 11 Unused 12 Unused 13 Unused 14 Unused 15 Unused	Y	N	
40307	I, WO	START Dryer		Write 1 to this address to start dryer	Y	Y	WARNING: Writing a "1" to this variable will start the dryer.
40308	I, WO	STOP Dryer		Write 1 to this address to stop dryer	Y	Y	WARNING: Writing a "1" to this variable will stop the dryer
44007	F, RO	Process Temp #1 @ inlet to hopper (8)		Sensor Span	Y	N	
44009	F, RO	Regen Temp after Regen heatbox (7)		Sensor Span	Y	N	
44013	F, RO	Return Air Temp @ inlet to Dryer (9)		Sensor Span	Y	N	
44017	F, RO	Return Air Temp Out of Hopper #1 (E)		Sensor Span	Y	N	

Register	Type	Description	Value	Range			Notes
44019	F, RO	Regen Heater KWH				Y	
44021	F, RO	Process Protect Temperature		Sensor Span	N	Y	
44025	F, RO	Process CFM (N)		0 - 200 CFM	N	Y	
44027	F, RO	Ambient Temperature		32 - 150 °F	N	Y	
44029	F	Drying Monitor High Alarm Setpoint	325 °F	100 - 400 °F	Y	Y	
44057	F, RO	Process Heater Current #1 (K1)		0.0 - 3276.7	N	Y	
44059	F, RO	Process Heater Current #2 (K2)		0.0 - 3276.7	N	Y	
44061	F, RO	Process Heater Current #3 (K3)		0.0 - 3276.7	N	Y	
44063	F, RO	Regen Heater Current #1 (L1)		0.0 - 3276.7	N	Y	
44065	F, RO	Regen Heater Current #2 (L2)		0.0 - 3276.7	N	Y	
44067	F, RO	Regen Heater Current #3 (L3)		0.0 - 3276.7	N	Y	
44069	F, RO	Total KWH			N	Y	
44127	F, RO	Average Dewpoint		(-80 - 140)°F	N	Y	
44153	F	Setback Temperature Min Setpoint	100 °F	70°F - Process Setpoint	Y	Y	
44155	F	Setback Temperature Setpoint	140 °F	Setback Temperature Min. Setpoint -- Process Setpoint	Y	Y	
44161	F	Setback Temperature Band	20 °F	0 - 100 °F	Y	Y	
44163	F	Min. Setback Process Setpoint	100 °F	70 - 300 °F	Y	Y	
44165	F	Setback Process Setpoint	140 °F	Min. Setback Process Setpoint - Process Setpoint	Y	Y	
44185	F	Process Setpoint High Limit	375 °F	Process Setpoint Low Limit - 450 °F	Y	Y	
44187	F	Process Setpoint Low Limit	70 °F	70°F - Process Setpoint High Limit	Y	Y	
44189	F	Process Setpoint	140 °F	Process Setpoint Low Limit - Process Setpoint High Limit	Y	Y	This is the process setpoint as entered at the display. This is the active process setpoint which may be modified by setback mode
44191	F, RO	Active Process Setpoint		Process Setpoint Low Limit - Process Setpoint High Limit	N	Y	
44271	F	After-Cooler Setpoint	100 °F	Aftercooler Setpoint Low Limit - Aftercooler Setpoint High Limit	Y	Y	
44293	F	Regen Setpoint High Limit	450 °F(Carousel) / 375 °F(Wheel)	Regen Setpoint Low Limit - 500 °F (Carousel) / Regen Setpoint Low Limit - 400 °F(Wheel)	N	Y	
44295	F	Regen Setpoint Low Limit	70 °F(Carousel) / 100 °F(Wheel)	70°F - Regen Setpoint High Limit (Carousel) / 100°F - Regen Setpoint High Limit (Wheel)	N	Y	
44297	F	Regen Setpoint	425 °F(Carousel) / 350 °F(Wheel)	Regen Setpoint Low Limit - Regen Setpoint High Limit	N	Y	
44379	F	DM2 Alarm Setpoint	10 °F	DM2 Alarm Setpoint Low Limit - High Limit	Y	Y	
44381	F	DM2 Alarm Offset	10 °F	5 - 100 °F	Y	Y	
44383	F	DM2 Alarm Band	40 °F	5 - 100 °F	Y	Y	
44391	F	Process High Alarm Setpoint	385 °F	70 - 450 °F	Y	Y	
44395	F	Process Low Alarm Setpoint	70 °F	70 - 450 °F	Y	Y	
44399	F	Process Deviation Alarm Setpoint	10 °F	3 - 25 °F	Y	Y	
44427	F	Regen High Alarm Setpoint	450 °F (Carousel) / 400 °F (Wheel)	70 - 500 °F	N	Y	
44431	F	Regen Low Alarm Setpoint	350 °F (Carousel) / 200 °F (Wheel)	70 - 500 °F	N	Y	
44435	F	Regen Deviation Alarm Setpoint	10 °F	3 - 25 °F	N	Y	
44447	F	Return Air Passive Alarm Setpoint	150 °F	70 - 450 °F	N	Y	
44449	F	Return Air Shutdown Alarm Setpoint	180 °F	70 - 450 °F	N	Y	
44451	F	CFM Low Alarm Setpoint	1 CFM	1 - 3200 CFM	N	Y	
44453	F	CFM High Alarm Setpoint	3200 CFM	1 - 3200 CFM	N	Y	
44471	F	Total Running Time	0	(0 - 999999) Hours	N	Y	
44479	F	Dewpoint Alarm Setpoint	-3 °F (Carousel) / 40 °F(Wheel)	-100 - 100 °F	Y	Y	
44577	F	Dewpoint Control Setpoint	-40	(-40 - 40)	Y	Y	
44579	F	Dewpoint High Deviation Alarm Setpoint	5 °F	3 ~ 10 °F	Y	Y	
44583	F	Dewpoint Low Deviation Alarm Setpoint	5 °F	3 ~ 10 °F	Y	Y	
44801	F, RO	Process Blower Contactor Counter	0		N	Y	
44803	F, RO	Process Blower Counter	0 Hr		N	Y	
44805	F, RO	Process Heater Counter	0 Hr		N	Y	
44807	F, RO	Process Heater Hi Switch Counter	0		N	Y	
44809	F, RO	Regen Blower Contactor Counter	0		N	Y	
44811	F, RO	Regen Blower Counter	0 Hr		N	Y	
44813	F, RO	Regen Heater Counter	0 Hr		N	Y	
44815	F, RO	Regen Heater Hi Switch Counter	0 Hr		N	Y	
44821	F, RO	Conveying Blower Counter	0		N	Y	
44823	F, RO	After-Cooler Valve Counter	0		N	Y	
44825	F, RO	Pre-Cooler Valve Counter	0		N	Y	
44827	F, RO	Alarm Horn Counter	0		N	Y	
44843	F, RO	Average Process Current	0 Amp		N	Y	
44845	F, RO	Average Regen Current	0 Amp		N	Y	
44847	F, RO	Average CFM	0 CFM		N	Y	
44853	F, RO	Regen Active Setpoint			N	Y	
44855	F, RO	Regen Outlet of the Wheel Temperature		Sensor Span	N	Y	
44863	F, RO	Drying Monitor #1 Temp		Sensor Span	N	Y	
44865	F, RO	Drying Monitor #2 Temp		Sensor Span	N	Y	
44867	F, RO	Drying Monitor #3 Temp		Sensor Span	N	Y	
44869	F, RO	Drying Monitor #4 Temp		Sensor Span	N	Y	
44871	F, RO	Drying Monitor #5 Temp		Sensor Span	N	Y	
44873	F, RO	Drying Monitor #6 Temp		Sensor Span	N	Y	